POPULAR SCIENCE

June 1948 · 25c

Your Back-Yard Resort

PAGE 74

IT'S FUN TO BE YOUR

and enjoy the home of your dreams!

Actual Size
8½ x 5½ in.

with the aid of the

COMPLETE HOME

Here's How This Book Will Save You Hundreds of Dollars

THIS amazingly comprehensive volume shows you how to do yourself all of the jobs around the house that have long needed doing—and a lot more you've wished *could* be done. In simple, practical language and pictures it shows you not only how to make your own repairs on your Plumbing, Wiring, Electrical Appliances, Masonry, Plaster, Heating System, Furniture, etc., but also how to *make valuable improvements* in your home, from a new closet to a whole new roof—from a new floor to a whole new modern kitchen.

No longer need today's high labor costs keep you from having the kind of home you'll be proud of—attractive, smooth-running, free from hazards, and equipped with every comfort! This COMPLETE GUIDE makes even the most unfamiliar job easy to do—and *fun* to do! You not only save time and money, you also enjoy the thrill of watching your home acquire new luxury, comfort and value.

More than 1,000 "How To Do It" Illustrations! 300,000 Words! • 512 Pages

Here is Just a Partial List of the Hundreds of "How-To-Do-It" Articles in this One Book:

HOUSE CONSTRUCTION AND MATERIALS

How to Build a Foundation
Types of Girders and Sills
Beams and Floor Joists
Building Materials
Types of Lumber
Roofing Materials—Asphalt, Asbestos, Aluminum, Wood Shingles
Concrete forms, mixing
How to Make All Types of Tinsmith Repairs

INTERIOR REPAIRS

Repairing Creaky Floors
Repairing and Storing Screens
Repairing Windows—sash cord, windowpanes; loosening stuck windows
Linoleum-laying, patching
Fixing Loose Tiles
Mending China, Metal Utensils
Repairing Door Locks, Hinges
Fire Fighting Equipment
Basement into Game Room
Building Partitions
Laying Hardwood Flooring, etc.

DECORATING

Wallpapering
Cleaning Wallpaper
Cleaning Painted Walls
Repairing Plaster
Scraping Floors
Refinishing Floors
Care of Carpets and Draperies

PAINTS AND PAINTING

Types of Paint Brushes
Types of Paint
Varnishes, Enamels
Lacquers, Shellac
Calcimine
Paint Thinners
Mixing Paints
Surface Preparation
Removing Paint
Painting a New Surface
Porch Floors and Steps
Painting Metal
Preparing Plaster
Fillers, Staining, etc.

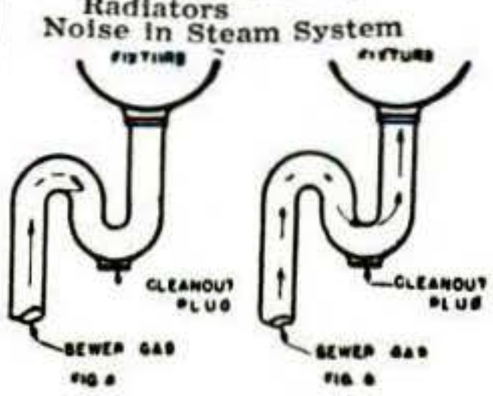
(Above) A simple little trick like knotting the wire inside extension plugs can save you severe burns, blown-out fuses, and fire hazards. Protect your home and family with the advice in this book!

ELECTRICITY IN THE HOME

Approved Electrical Equipment
Home Generators
Fuse Boxes and Fuses
Appliance and Extension Cords
Replacing Fixture Sockets
Electric Motors
Home Signalling Systems
Burglar Alarms, etc.

HEATING THE HOUSE

Chimneys
Coal Furnaces, Oil Burners
Automatic Draft Regulators
Thermostats
Fuel Economy
Warm Air Heating Systems
Steam Heating Systems
Cleaning, Adjusting Radiators
Noise in Steam System
Hot Water Heating System
Repacking Leaky Valves
Cleaning Boilers
Cleaning the Furnace
How to Insulate Your House
How to Build and Install Storm Windows
Efficient Weather Stripping, etc.



PLUMBING

Water Supply
Cause of Dirty Water
Repairing Sewage System
Cesspools, Septic Tanks
Stopped Up Sewer Pipes
Stopped Up Drains
Chemical Drain Cleaners
Plumbing Traps
Noisy Plumbing
Repairing Hot Water Tanks
Thawing Frozen Pipes
Water Softening Equipment
Repairing Faucets, Flush Tanks, Leaky Pipes, etc.

EXTERIOR REPAIRS

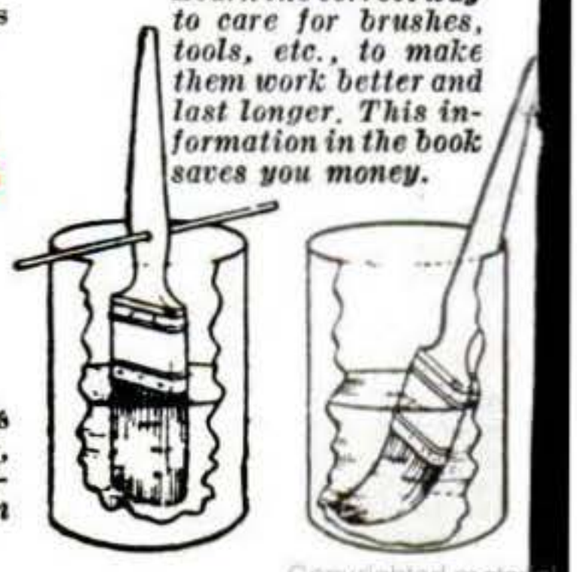
Waterproofing Damp Basements
Waterproofing Masonry Walls
Repairing Cracks in Foundation, Stucco Walls
Repairing Brick Walls
Repairing Leaky Roofs
Caulking Seams
Gutters and Downspouts
Ridding the House of Termites, etc.

YOUR GARDEN

Building Garden Paths
Building Garden Pool
Care and Use of Garden Tools
Cold Frames
Rustic Screens and Arches
Building an Outdoor Fireplace
Erecting Garage, Summer Guest House or Play House in Garden, etc.

(Left) You SEE diagrams that help you locate and, with little effort, fix plumbing noises, leaks, and drain stoppages.

Learn the correct way to care for brushes, tools, etc., to make them work better and last longer. This information in the book saves you money.



Copyrighted material

OWN HANDYMAN!

Here's Everything You Need to Know to Do Your Own Repairing, Beautifying, Modernizing, Converting! The A to Z of CARPENTRY, PLUMBING, PAINTING, DECORATING, WIRING AND APPLIANCES, MASONRY, FURNITURE REPAIR, HEATING SYSTEMS—*all in one book!*

HANDYMAN'S GUIDE

ake a New Kitchen, Game Room or Bathroom! Build an Extra Apartment and Live Rent-Free!

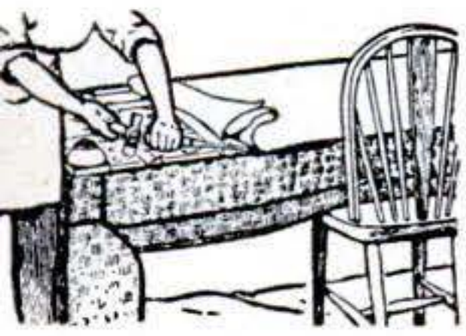
re's 1,001 methods to help make your house more eable—and add hundreds, even thousands of dol- s to its value. Need new closet space? Want to minate that dangerous draft in the baby's room? decorate sister's room? Build a garden walk? y a new linoleum floor? Get better winter heat less money?

Want to convert your basement or attic into a. ra apartment and give yourself a rent income t may well offset a good part or all of your es, mortgage payments and other expenses?

You can make these improvements yourself, at prisingly little cost, with the help of *The Com- te Home Handyman's Guide.*

asy Step-by-Step Instructions in lear Pictures and Simple Text!

is book assumes no mechanical knowledge or ll on your part. It starts from the very begin- , explaining how to select and use tools and terials. It gives you detailed information every p of the way, from repairing a lamp or iron to talling a complete wiring system; from repairing chair-leg to rebuilding your upholstery; from ying a paintbrush to repainting the house inside l out. More than 1,000 ILLUSTRATIONS, ac- ately and explicitly drawn, make the complete tructions easy to follow. This is the *number one* ok for your home. It will repay its astonishingly all cost many times over within a short time!



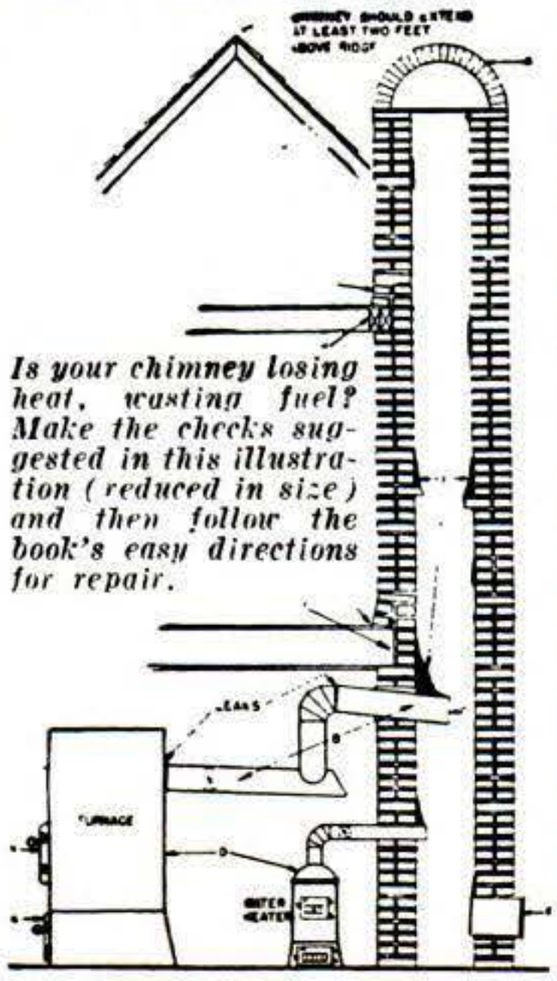
(Left) Furniture upholstery and repair is a fascinating and money-saving hobby when you follow the easy step-by-step instructions in this book.

URNITURE CARE AND REPAIR

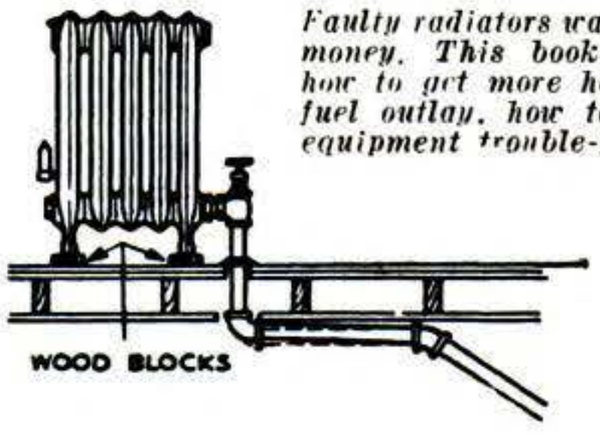
- olstery of Chairs, Sofas, etc.
- lacing Worn Springs
- engthening Frame
- niture Upkeep, Clean- ng, Removing Water Stains, Marks, Scratches, etc.
- se Joints
- ken Chairs
- ishes and Polishing
- ining, etc.

OUR TOOL KIT

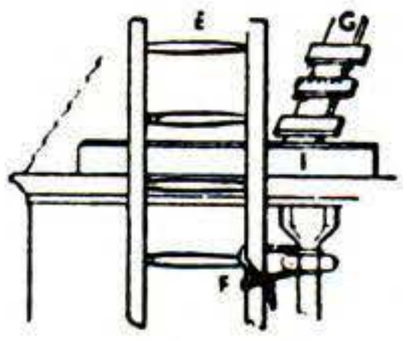
- ipping Your Workshop
- ecting the Right Tools
- rect Use of Tools
- e of Tools
- v to Sharpen Tools
- dpapers, Glues, etc.
- dering Equipment
- nd Technique

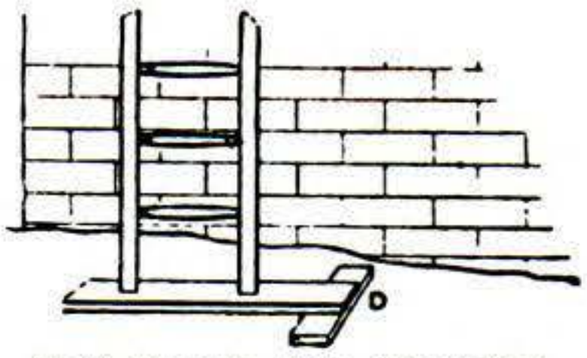


Is your chimney losing heat, wasting fuel? Make the checks suggested in this illustration (reduced in size) and then follow the book's easy directions for repair.

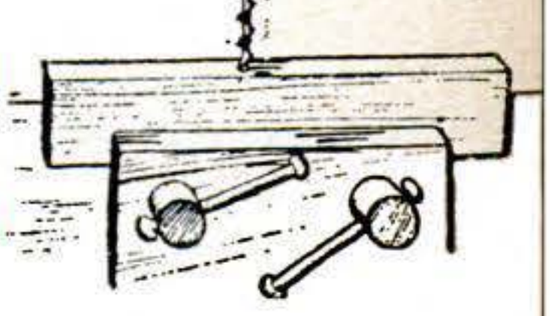


Faulty radiators waste heat and money. This book shows you how to get more heat for your fuel outlay, how to keep your equipment trouble-free.





Avoid hazards. This illustration shows how to secure a ladder when you make roof repairs. Complete instructions for repairing walls, foundations, gutters, shingles, etc.



How to equip a workshop, how to use all types of tools, how to use sandpaper and glues—all are fully covered in this "show-me-how" volume.

Yours for a Week's Free Trial!

Think of getting in this one big 512-page volume all the practical information you need to do a good professional-looking job of repairing or improving any part of your home—from cellar to chimney-top! Think of getting all this—not for the $18.00 or $24.00 you would expect to pay for 6 or 8 books covering all these fields—but for the miracle price of only $3.95! But don't take our word for this big value. Examine FREE, at our risk and expense, a copy of the *Complete Home Handyman's Guide.* Just mail the coupon below. When the book arrives, test it a full week FREE! If you don't agree it's the best money-saving buy ever, return it without further obligation. If you keep it, pay the small price in small monthly installments. But act at once. Our limited printing is inadequate to meet the demand. Wm. H. Wise & Co., Inc., 50 W. 47th St., New York 19, N. Y.

Copyright 1948 by Wm. H. Wise & Co., Inc.

MAIL THIS FREE-TRIAL COUPON!

Wm. H. Wise & Co., Inc., 50 West 47th Street, New York 19, N. Y.

Without obligation to me, rush me immediately, for Free Examination, a copy of the big new 512-page "COMPLETE HOME HANDYMAN'S GUIDE", bound in sturdy rich Novelex and profusely illustrated with more than 1,000 "How-to-do-it" pictures. After a full week's free trial, I will either return the book promptly and owe you nothing, or I will keep it and remit only $1 monthly until the amazingly low price of only $3.95 plus a few cents postage, is paid.

DO NOT WRITE IN BOXES

☐ *Check here for De Luxe Edition at only $1 extra.*

153

SAVE CHARGES on 3 LB SHIPMENT. Send only $3.95 with this coupon and we will stand all shipping charges. Same return & refund privilege. ($4.95 for De Luxe.)

806

MR. MRS. MISS .....

(Print Plainly in Block Letters)

ADDRESS .....

CITY & ZONE NO. ..... STATE .....

☐ **COMPANION VOLUME.** Initial here to reserve "PRACTICAL AND TECHNICAL ENCYCLOPEDIA"—ready in a few months—to be shipped to you for FREE trial. 640 pages, over 1,000 pictures, thousands of subjects. Covers Autos, Mechanical, Electrical, and Aeronautical Engineering, Building, Plumbing, Metallurgy, Chemistry, Printing, Sheet Metal and Foundry Work, Radio, and Television, etc. Only $4.95 plus postage. Same easy terms.

Copyrighted Material

FOUNDED 1872

POPULAR SCIENCE

MECHANICS AND HANDICRAFT REG. U.S. PAT. OFF. *Monthly*

VOL. 152: NO. 6

EDITOR: Perry Githens

MANAGING EDITORS: Fred O. Newman, Volta Torrey. **ART EDITOR:** Howard C. Jensen.

MECHANICS & HANDICRAFT EDITOR: Harry Walton.

ASSISTANT MANAGING EDITORS: Hartley E. Howe, Frank Rowsome, Jr.

ASSOCIATE EDITORS: Howard Allaway, Alden P. Armagnac, Devon Francis, Robert Gorman, Sheldon Gallager, Herbert Johansen, Martin Mann, Denis Sneigr, Robert P. Stevenson.

STAFF PHOTOGRAPHERS: W. W. Morris (Chief), Hubert Luckett, Orlando Guerra (Darkroom).

WESTERN EDITOR: Andrew R. Boone (Los Angeles).

ART DIRECTOR: Harry Samuels. **ART ASSOCIATES:** Herbert Anthony, Eric Karminski, Jr., Richard Meyer, Saverio Rada, Frances Cooper (Production).

EDITORIAL ASSISTANTS: Mae G. Dyer (Assistant to the Editor), Julia Charnif, Carol Ennis, Charlotte Korch, Georgette Sparks, Ruth Westphal.

WASHINGTON CORRESPONDENT: John F. Loosbrock

PUBLISHER: Godfrey Hammond

CONTENTS FOR JUNE, 1948

Cover painting by Ray Quigley

Science News

New Floating Bearing..... 82
Magnetic Oil Holds New Clutch Tight.... 83
Rockets Carry the Mail..... 88
Secret Sea Peak Found..... 96
Planes Race Past Sound.....102
Army Grows Biggest Crystal.....112
Cable-Eating Gophers Foiled at Last....127
Gas Pipe Takes to Air.....134
Streamlining Speeds New Subs.....135
Makes More X Rays.....143
More Power, Less Fuel.....144

Science at Work

"Boots" Protect Bridges..... 96
Sniffs Gas Leaks.....113
Ship-Hider Fights Bugs.....113
Porcelain Skin Protects Prefab.....114
How a Vacuum Coffee Maker Works....125
Mill Rolls Steel at 70 Miles an Hour.....139

PS Features

Help Yourself to a Back-Yard Resort.... 74
Train Space at a Glance..... 90
Seven-League Hands for Hot Atoms..... 91
Office Goes Up and Down.....100
It Pays to Know Your Wallpaper.....106
Cartoons Teach Physics with a Smile....126
Top Scientist Has His Own Shop.....128
New Phonograph Runs Itself All Day....132
Curb Bank Uses Mirrors.....134
Arctic Mine Yields Atom Ore.....136
Gravity Aids Grocers.....138
Model Engine Handles Real Logs.....166
Buying Packaged Breezes for Summer....168
You Can't Destroy Energy.....210

Aviation

Going Up in Smoke..... 73
What's New in Aviation..... 86
Lamps Signal Danger..... 90
Plane Antennas Go Into Hiding.....111
Jet Goes to College.....118
New Jet Hits the Deck For U. S. Navy..121
Guillotine Cuts Planes.....134
B-29 Lays Biggest Egg.....138
Egg-Beaters Try Jet.....144

Automobiles

New Bus Built for Comfort.....101
Rocker-Beam Engine in Motorcycle.....145
Hints from the Model Garage.....146
Gus Troubleshoots by Ear.....148
Patch Up Your Car with Cloth.....152
Homemade Midget Car for Three.....154
Seat Covers of Plastic Yarn.....188
Filter Has Replaceable Screen.....188
Mechanic's Light Fits on Head.....212
Spring Limits Speed of Car.....216

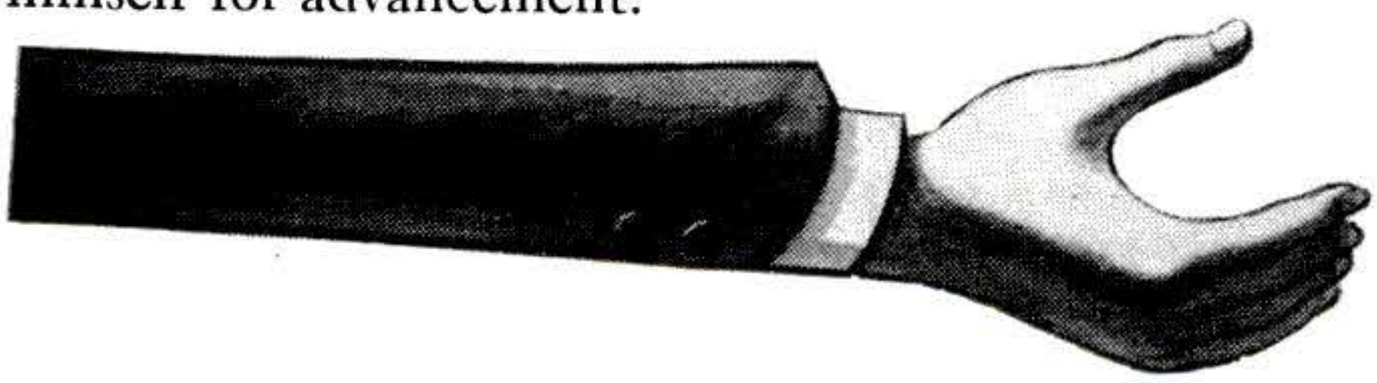
Ⓣ *This mark in text indicates Trade Name.*

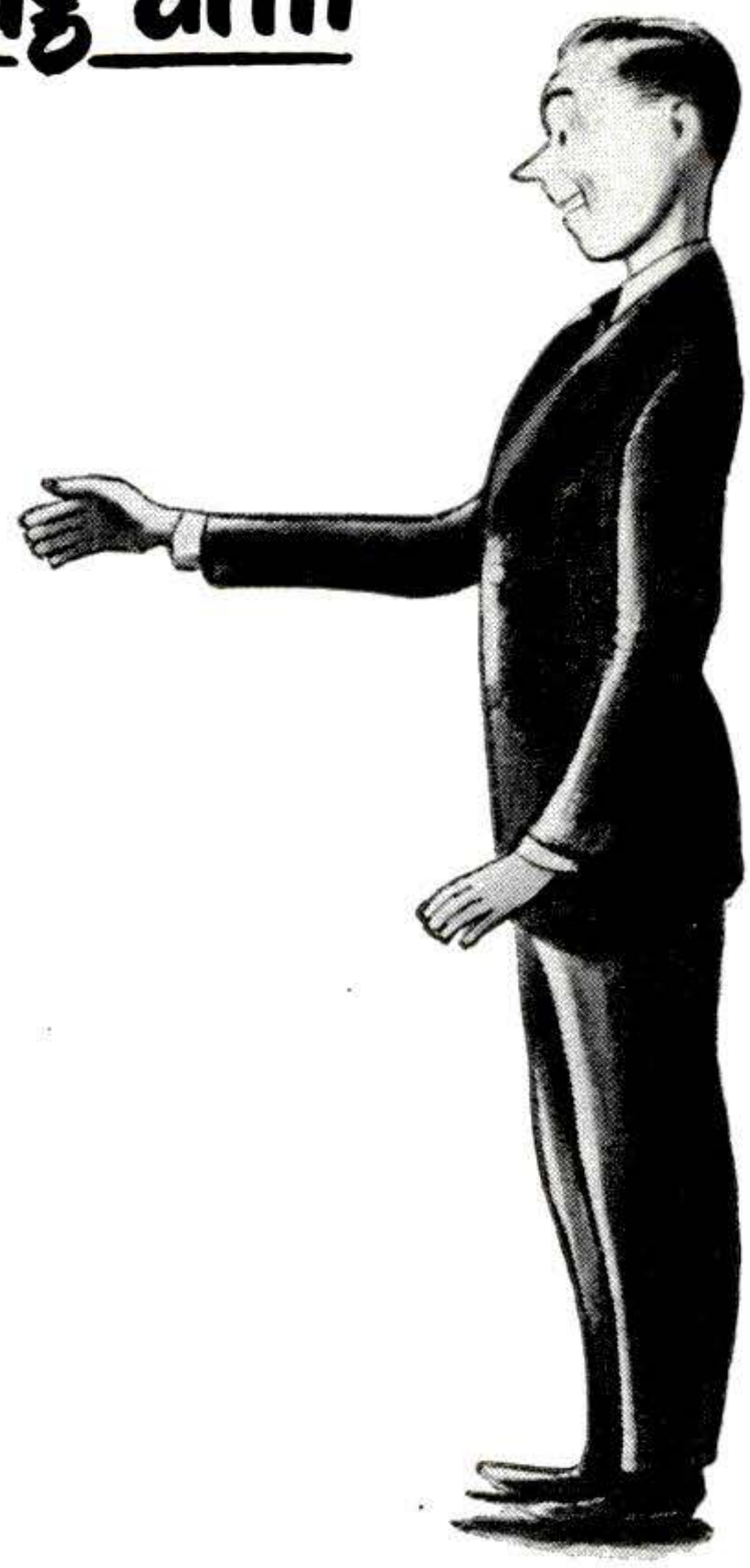
Continued on page 4

Popular Science is published monthly at 353 Fourth Avenue, New York, N. Y., by Popular Science Publishing Co., Inc. Godfrey Hammond, President and Treasurer; R. C. Wilson, Raymond J. Brown, Stephen P. Glennon, Vice-Presidents; F. W. Briggs, Secretary. Entered as second-class matter Dec. 28, 1918, re-entered as second-class matter February 11, 1948, at the Post Office in New York, N. Y., under the act of March 3, 1879; additional entry as second-class matter at Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U.S.A. Copyright, 1948, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all countries participating in the International Copyright Convention and Pan-American Copyright Convention. Yearly subscriptions to United States, its possessions and Canada, $2.50 (2 years, $4.50; 3 years, $6.00); foreign countries $1 per year extra. Subscribers must notify us of change of address four weeks in advance of the next publication date. Be sure to give both old and new addresses, including zone numbers. Vol. 152: No. 6.

OPPORTUNITY has a long arm

It isn't even necessary to go half-way to meet Opportunity. It seeks out the man who has prepared himself for advancement.





I.C.S. training is one of the effective forms of preparation. When you have mastered an I.C.S. Course, you're ready and able to take on larger responsibilities in your chosen field.

In a single period of four months, I.C.S. has received as many as 1,920 student letters reporting advancement in salary and position. Graduates include the presidents, board chairmen, chief technicians of some of the largest industrial, transportation, publishing and other enterprises in the nation.

You can get ready for Opportunity as they did. Mark and mail the coupon *today* and be prepared for tomorrow's rewarding openings.

INTERNATIONAL CORRESPONDENCE SCHOOLS

ICS

BOX 7607-M, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Air Conditioning and Plumbing Courses
- ☐ Air Conditioning
- ☐ Heating ☐ Plumbing
- ☐ Refrigeration ☐ Steam Fitting

Chemistry Courses
- ☐ Chemical Engineering
- ☐ Chemistry, Analytical
- ☐ Chemistry, Industrial
- ☐ Chemistry, Mfg. Iron & Steel
- ☐ Petroleum Refining ☐ Plastics
- ☐ Pulp and Paper Making

Civil Engineering, Architectural and Mining Courses
- ☐ Architecture
- ☐ Architectural Drafting
- ☐ Bridge and Building Foreman
- ☐ Building Estimating
- ☐ Civil Engineering
- ☐ Coal Mining
- ☐ Contracting and Building
- ☐ Highway Engineering
- ☐ Lumber Dealer
- ☐ Reading Structural Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Drafting
- ☐ Structural Engineering
- ☐ Surveying and Mapping

Communications Courses
- ☐ Electronics
- ☐ Practical Telephony
- ☐ Radio, General
- ☐ Radio Operating
- ☐ Radio Servicing
- ☐ Telegraph Engineering

Electrical Courses
- ☐ Electrical Drafting
- ☐ Electrical Engineering
- ☐ Electric Light and Power
- ☐ Lighting Technician
- ☐ Practical Electrician

Internal Combustion Engines Courses
- ☐ Auto Technician ☐ Aviation
- ☐ Diesel-Electric
- ☐ Diesel Engines ☐ Gas Engines

Mechanical Courses
- ☐ Aeronautical Engineer's, Jr.
- ☐ Aircraft Drafting
- ☐ Flight Engineer
- ☐ Forging ☐ Foundry Work
- ☐ Heat Treatment of Metals
- ☐ Industrial Engineering
- ☐ Industrial Metallurgy
- ☐ Machine Shop
- ☐ Mechanical Drafting
- ☐ Mechanical Engineering
- ☐ Mold-Loft Work
- ☐ Patternmaking—Wood, Metal
- ☐ Reading Shop Blueprints
- ☐ Sheet-Metal Drafting
- ☐ Sheet-Metal Worker
- ☐ Ship Drafting ☐ Ship Fitting
- ☐ Tool Designing
- ☐ Toolmaking
- ☐ Welding—Gas and Electric

Railroad Courses
- ☐ Air Brake ☐ Car Inspector
- ☐ Diesel Locomotive
- ☐ Locomotive Engineer
- ☐ Locomotive Fireman
- ☐ Railroad Section Foreman

Steam Engineering Courses
- ☐ Boilermaking
- ☐ Combustion Engineering
- ☐ Engine Running
- ☐ Marine Engineering
- ☐ Steam Electric ☐ Steam Engines

Textile Courses
- ☐ Cotton Manufacturing
- ☐ Rayon Weaving
- ☐ Textile Designing
- ☐ Woolen Manufacturing

Business and Academic Courses
- ☐ Accounting ☐ Advertising
- ☐ Arithmetic ☐ Bookkeeping
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Certified Public Accounting
- ☐ Commercial
- ☐ Commercial Art
- ☐ Cost Accounting
- ☐ Federal Tax
- ☐ First Year College
- ☐ Foremanship ☐ French
- ☐ Good English ☐ High School
- ☐ Higher Mathematics
- ☐ Motor Traffic ☐ Postal Service
- ☐ Salesmanship ☐ Secretarial
- ☐ Sign Lettering
- ☐ Spanish ☐ Stenography
- ☐ Traffic Management

Name _____ Home Address _____

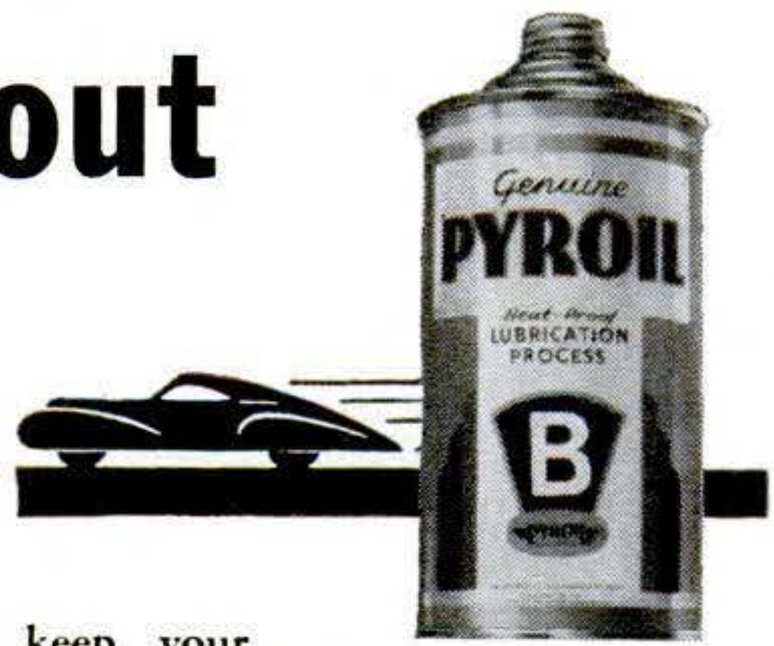
City _____ State _____

Age _____ Present Position _____ Working Hours _____ A.M. to _____ P.M.

Special tuition rates to members of the Armed Forces. Special discount to World War II Veterans.
Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

Copyrighted material

SMOOTH inside and out



You may keep your car bright and shiny and feel that you are doing all you can to keep it smooth looking on the highways. But to be really smooth, your car must also be smooth running and trouble free. *And it is easy with Pyroil.*

Pyroil gives oil the property of clinging to cylinder walls so that every stroke of the cylinder, from the time you step on the starter, moves on a cushion of lubrication. Pyroil prevents wear—it dissolves sludge.

Ask your gas station attendant to add Pyroil . . . and add smooth miles to your car.

GIVEN! An attractive Pyroil metal savings bank—takes coins up to 50c pieces —is yours for the asking—sent postage paid.

PYROIL for Aircraft Engines

Use Aircraft Pyroil B for lubricating oil, Aircraft Pyroil A for gasoline.

Manufactured and Guaranteed by Pyroil Company, 323 Main Street, La Crosse, Wisconsin.

Canadian Distributors: Central Purchasing Agencies, Ltd., Toronto, Ontario

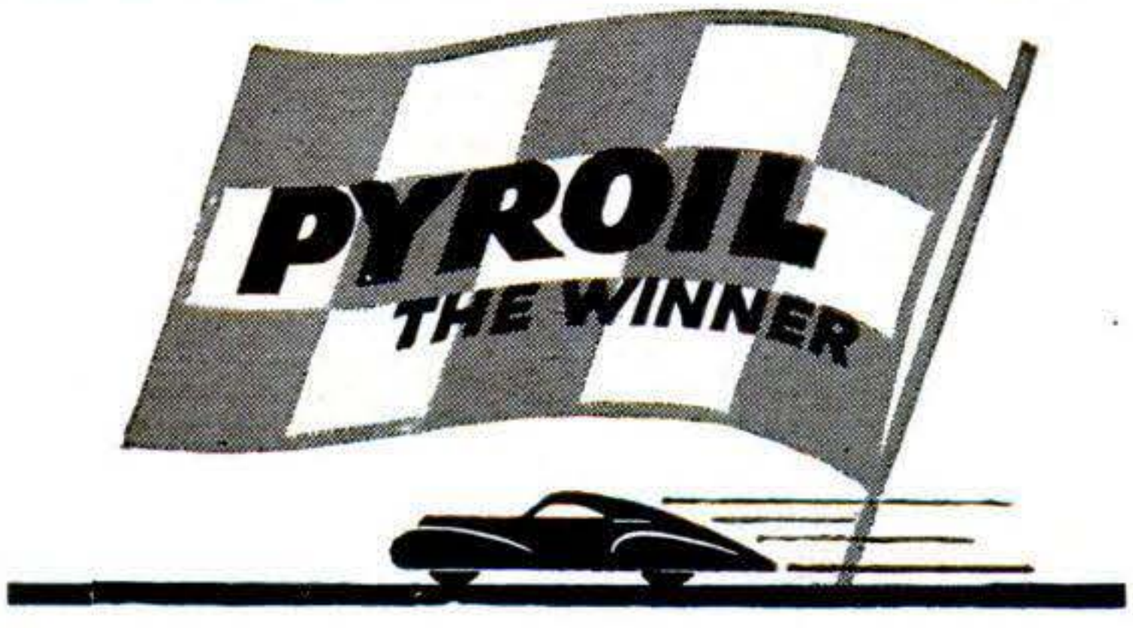
PYROIL COMPANY
323 Main Street, La Crosse, Wisconsin

I want my car to last and run properly. Please tell me more about Pyroil and how it can accomplish this for me.

Name.....

Address.....

City or Town.....State.....



Inventions

Handle Fits Your Hand.....105
New Ideas From the Inventors.....116
Robot Cleans, Paints, Dries.....119

Photography

Photos Print on Cloth..... 82
World's Fastest Camera.....143
Camera on Broom Shoots a Strike.....190
Photo Ideas And Equipment.....191
Darkroom Built in a Closet.....192
Mining Silver in Your Darkroom.....206

Mechanics & Shopwork

"Workhorse" Carries Your Tools.....159
Post Lamps to Mark Your Drive.....160
Line Spacer for Drafting.....176
Hand Beveling and Chamfering.....178
T-Square Rolls on Gears.....183
"Faceplate" Aids Lathe Milling.....184
Making Your Own Rotary Planer.....185
Pipe Seals Garage Doors.....208
Acid-Core Solder Is Leakproof.....212
Two Clamps Make a Big One.....213
Chalk Used as Soldering Mask.....215
Gears Work Offset Screwdriver.....216

Home Mechanics & Handicraft

Action Station for Small Fry.....156
Wire-Grille Doors on Cabinet.....164
Hanging Hurricane Lamp.....167
Furniture From the Forest.....173
Ebony and Plastic Pipe Rack.....176
Lace Design Cut in Candy Plate.....177
Chess Ashtray is Hand Carved.....201
Models Duplicate Real Houses.....202
Heat Repairs Plastic Toys.....203
Insulation Reflects Radiant Heat.....213
Tray Increases Scale Capacity.....214
Hidden Attic Stairs Fold Up.....215
Chisel Rack Protects Edges.....216

Radio & Electricity

How You'll See a President Nominated.. 97
Television Images Magnified.....194
Felt Pads Stop Record Slip.....194
News in Electronics.....195
How to Buy Radio Parts.....196
Electronic Timer Checks Racers.....212

Departments

Letters 16
Voice of Science..... 71
I'd Like to See **Them** Make.....120
What's Your Ingenuity Quotient?.....161
Aids to Modern Living.....162
New Tools.....182
New Shop Ideas.....186
Craftsmen at Work.....189
Keeping the Home Shipshape.....204
Gadgets for Play Hours.....209
Editorial Memo.....286

Copyrighted material

There's always ONE best buy!

All cars have TIRES but in the lowest-priced field only PLYMOUTH has SUPER-CUSHION TIRES on SAFETY-RIM WHEELS

Bigger, smoother-running Super-Cushion Tires soak up road shocks from the side as well as below. They reduce chances of tire failure but, if trouble occurs, you have the protection of new, wider Safety-Rim Wheels.

All cars have FILTERS but in the lowest-priced field only PLYMOUTH has an OILITE GAS FILTER

Here's a feature that stops trouble for you before it can start. Located in the gas tank, Plymouth's filter keeps dirt and water from passing into the fuel system. You never have to worry about a blocked or frozen gas line.

Isn't your *one* best buy among lowest-priced cars the *one* that's most like high-priced cars?

You're the judge of that and you're the one to judge the cars. You'll find that Plymouth has 20 of 21 features found in most high-priced cars — far more than any other low-priced car.

And what's more, Plymouth gives you the extra value of Super-Cushion Tires on new, wider Safety-Rim Wheels, trouble-free gas filter, Safe-Guard Hydraulic Brakes a third more efficient, and many other great engineering advances. Judge for yourself the one best buy!

PLYMOUTH BUILDS GREAT CARS

2ND INTERNATIONAL MODEL PLANE CONTEST

Sponsored by Plymouth Motor Corporation • Subsidiary of Chrysler Corporation

AUGUST 18-23 • DETROIT, MICHIGAN

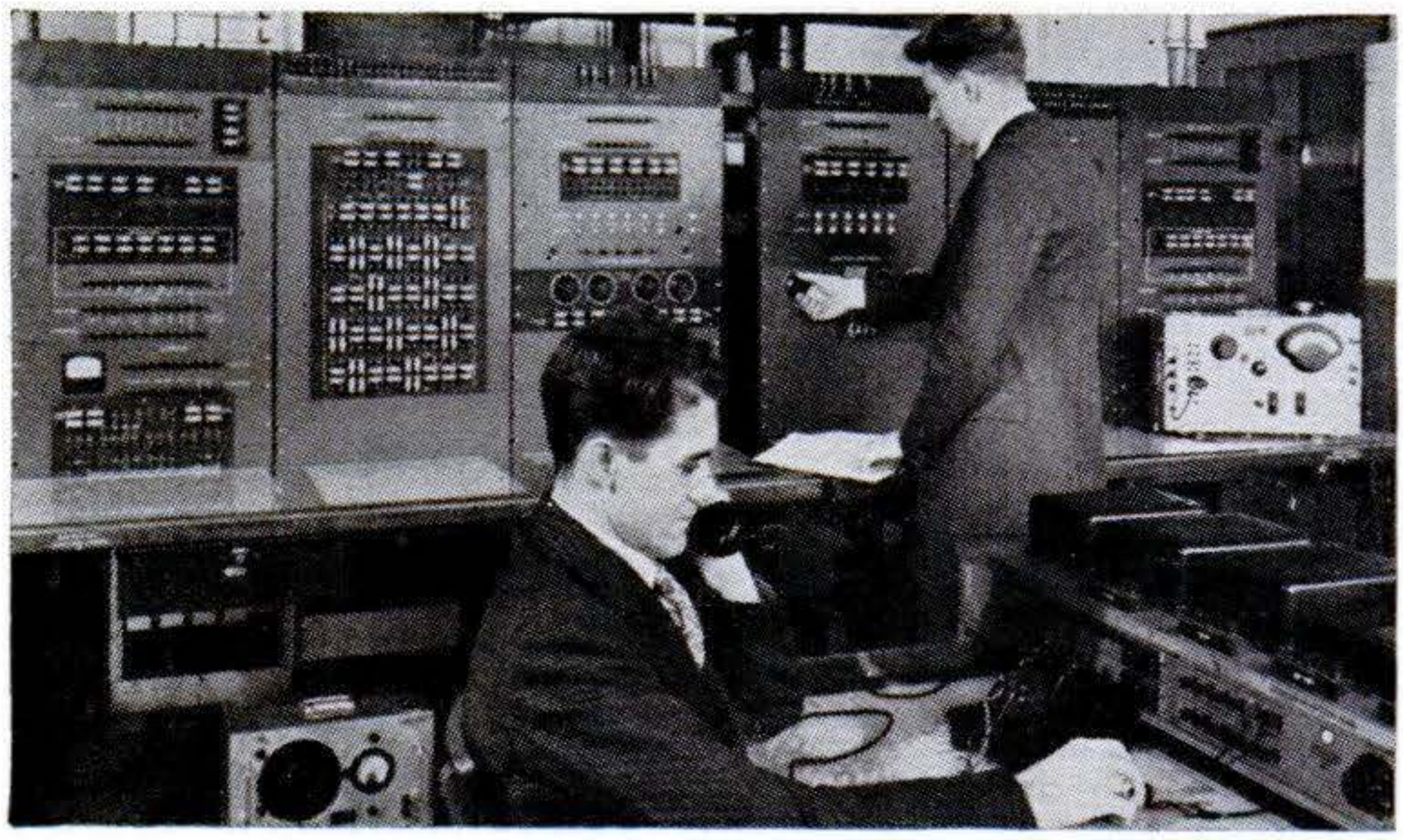
Ask your Plymouth dealer for full information

IF IT'S VALUE YOU WANT IT'S PLYMOUTH YOU WANT

Copyrighted material

These "sound jurors" record their preferences as they listen over test circuits.

Trial by "Sound Jury"



The engineer in the foreground talks over the test circuits which the other engineer sets up on a "circuit simulator."

After Bell Laboratories engineers have designed a new talking circuit, they measure its characteristics by oscilloscopes and meters.

But a talker and a listener are part of every telephone call, and to satisfy them is the primary Bell System aim.

So, before the circuit is put into operation, a "sound jury" listens in. An actual performance test is set up with the trained ears of the jurors to supplement the meters.

As syllables, words, and sentences come in over the telephones, pencils are busy over score sheets, recording the judgment of the listeners on behalf of you and millions of other telephone users.

Targets of the transmission engineer are: your easy understanding of the talker, the naturalness of his voice, and your all-around satisfaction. To score high is one of the feats of Bell System engineering.

BELL TELEPHONE LABORATORIES

• EXPLORING AND INVENTING, DEVISING AND PERFECTING FOR CONTINUED IMPROVEMENTS AND ECONOMIES IN TELEPHONE SERVICE

Copyrighted material

"What's he got that I haven't got?"

LOOK at the successful men you know. "What have they got" that you haven't?

Very little, probably. In most ways these men are no brighter or naturally more capable than average. Many of them probably have no more formal education or better natural aptitudes than you.

But that little extra they have is important. They have the special knowledge and ability for which business is glad to pay well—they know the what, why and how of business. They have also the confidence and aggressiveness which come from knowing that they know and can apply their knowledge.

You may add that extra—may get that same profitable knowledge and ability—that same confidence and aggressiveness—if you are willing to pay the price in earnest, necessary study. For LaSalle has spent 38 years developing, testing and proving, with over a million student members, spare-time success training in certain specialized business fields. What scores of thousands of men and women—many just like you—have done, you should be able to do.

You need not leave your home or interrupt your job; you need pay comparatively little money. But you must be ambitious and willing to study seriously. And soon after you start training, the results will begin to show up in your own confidence and in your work. For what you learn at home tonight is so practical that often you can apply it on the job tomorrow.

How much do you want success—more money, a promotion or a new job, prestige and responsibility? If you really want it, you will use the coupon below to find out what LaSalle training can do for you. It costs only a postage stamp, but a coupon like it has been the starting point to real success for scores of thousands—and can be for you.

LA SALLE Extension University
A Correspondence Institution
Dept. 683-R • 417 S. Dearborn • Chicago 5, Ill.

I want to know how LaSalle can help me win success in the field I have checked below. Please send me your free 48-page booklet about that field and your success training in it.

- ☐ Accountancy
- ☐ Bookkeeping
- ☐ C.P.A. Coaching
- ☐ Business English
- ☐ Law: LL.B. degree
- ☐ Foremanship
- ☐ Salesmanship
- ☐ Effective Speaking
- ☐ Business Management
- ☐ Industrial Management
- ☐ Traffic Management
- ☐ Stenotypy (Machine Shorthand)

*Name*_____ *Age*_____

*Position*_____

*Address*_____

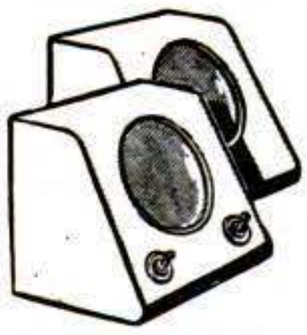
*City, Zone and State*_____

LASALLE EXTENSION UNIVERSITY
A Correspondence Institution

Copyrighted material

ELECTRONIC KITS
For HOBBYISTS and EXPERIMENTERS

INTERPHONE
2-WAY CALL SYSTEM KIT



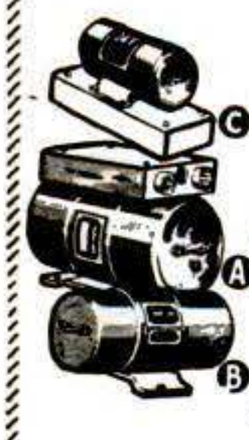
Ideal call and communication system for homes, offices, factories, stores, etc. Makes excellent electronic baby watcher, easy to assemble with every part supplied including simple instructions. Distance up to 1/5 mile. Operates from 110-V A.C. 3 tubes, one master and one remote speaker.

Shipping Wt. 5 lbs.
$14.50

GN58 GENERATOR

Makes excellent home lighting plant, operated by wind propeller, waterfall, gas engine, or hand crank. Reduction gear allows full output at slow speed; supplies 6 volts at 2.45 amp., 425 volts at .115 amp. New. Add postage for 28 lbs. **$7.95**

DYNAMOTORS



C **$1.95**

A **$5.95**

B **$5.95**

An electric motor operating a generator on same shaft—hundreds of uses—gives high voltage from storage battery.

Dynamotor C—Input 28 volts, output 220 volts at 60 MA. Add postage for 6 lbs.

Dynamotor A—Input 12 volts, output 1000 volts at 350 MA. Shipping weight, 72 lbs.

Dynamotor B—Input 6 or 12 volts, output 500 volts at 160 MA. Shipping weight, 30 lbs.

GENERAL ELECTRIC TRANSMITTER-RECEIVER
FOUNDATION

A beautifully constructed tuner containing the best in variable condensers, coils, vennier dials, etc., at least $30.00 worth of parts, complete with conversion instructions to transmitter and receiver. Add postage for 20 lbs. **$2.49**

GENERAL ELECTRIC BC 645
TRANSCEIVER

10 times as powerful as a walkie talkie

$14.95
2 for **$27.00**

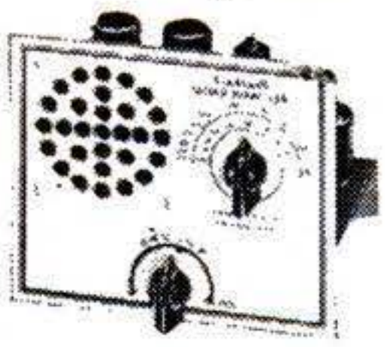
A brand new two-way communication set which cost the Army over $400.00 and is ideal for two way communication between house and cars, office, service trucks, ambulances, boats, etc. Range up to 15 miles in the 450 to 500 Megacycle band. Operates in the new citizens band. Supplied complete with 15 tubes and conversion instructions to operate from 110 V A.C. Add postage for 25 pounds.

ACCESSORIES NEEDED

PE101C Dynamotor for 12 or 24 Volt storage battery operation $3.95
110 V A.C. Power Supply to operate BC 645 from house current $11.95
T-32 Table Microphone..... $2.95
Microphone Transformer.... $1.00
5" PM Speaker for BC 645 $2.80

HEATHKIT 3-TUBE ALL-WAVE RADIO

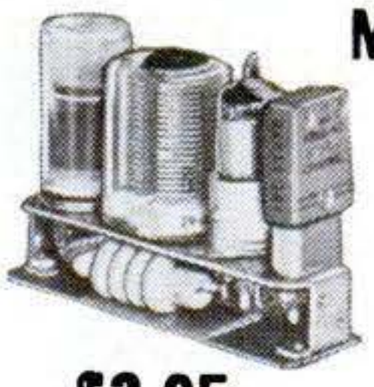
110-volt AC operation **$8.75**



An ideal way to learn radio. This kit is complete ready to assemble, with tubes and all other parts. Operates from AC Simple, clear detailed instructions make this a good radio training course. Covers regular broadcasts and short wave bands. Plug-in coils. Regenerative circuit. Operates loud speaker. Battery model for use where no AC house current is available. Add postage for 3 lbs

Heathkit Beginners' Radio 110-volt type.....	$8.75
Heathkit Beginners' Radio, battery type (2 tubes, no rectifiers)	$8.75
Headphones for either type HS 30 per set	$1.00
2½" permanent magnet loudspeaker for either type	$1.95
Batteries, complete kit for battery type set	$3.25

MIDGET TRANSMITTER KIT



$3.95

Complete kit to assemble a 1 Watt battery operated amateur 80 meter transmitter, including tube and crystal. Range up to 500 miles. Only accessories needed are sending key and batteries. Complete instructions supplied. Add postage for 2 lbs.

Key—add postage for 2 lbs. **$1.00**

Batteries—add postage for 4 lbs **$3.25**

THE NEW 1948 HEATHKIT 5"
OSCILLOSCOPE KIT

Complete kit to build a beautiful 5" oscilloscope. Ideal for studying and servicing television and FM radio. 6 tubes including 5BP1 cathode ray tube. 1500-volt power supply operates from 110-V 60 cy A.C. Has compensated vertical and horizontal amplifiers and 15 cy to 30 KC sweep generator. Detailed instructions make assembly easy. Shipping weight, 35 lbs. Nothing else to buy **$39.50**

WRITE FOR LITERATURE ON HEATHKIT SERVICE INSTRUMENTS

MINIATURE HEADPHONES

$1.00 Hearing aid type, comfortable, keeps out outside noise, one of the army's best types. Add postage for 2 lbs.

T32 TABLE MICROPHONE

One of the army's finest built by Kellogg. Ideal for public address, transmitters, etc. Add postage for 5 lbs.. ... . **$2.95**

G. E. CIRCUIT BREAKER

$2.95 Protect your electrical equipment, eliminate fuses. 50 AMP 220 Volt rating. Add postage for 4 lbs.

MINIATURE MOTOR

24V.D.C. size 1¼"x 1"x2" Add postage for 1 lb. **$2.95**

ORDER DIRECT FROM THIS AD
Include postage for weight shown. Print name and address. No orders under $2.00

The HEATH COMPANY
★ ★ ★ DEPT. S . . BENTON HARBOR, MICH.

Copyrighted material

AUDELS REFRIGERATION & AIR CONDITIONING GUIDE.....$4

New from Cover to Cover—1280 Pages, Fully Illus. Covering basic principles, servicing, operation & repair of household, commercial & industrial refrigeration & air conditioning. A gold mine of essential important facts for engineers, servicemen, users.

AUDELS CARPENTERS & BUILDERS GUIDES—4 Vols. $6

A practical illustrated trade assistant on modern construction for carpenters, joiners, builders, mechanics and all woodworkers. 4 vols., 1600 pages, 3700 illustrations, flexible covers. Pocket size. Each volume sold separately $1.50 a vol.

AUDELS AUTOMOBILE GUIDE.....$4

A practical quick ready reference book for auto mechanics, service men, operators & owners. Explains theory, construction & servicing of modern motor cars, trucks, buses & auto type Diesel engines. 1700 pages, fully illustrated. 55 chapters. Indexed. A standard book for mechanics. New fluid drive covered.

AUDELS DIESEL ENGINE MANUAL..$2

A practical, concise treatise with questions and answers on the theory, operation and maintenance of modern diesel engines including General Motors 2 cycle Diesel. 384 pages, fully illus., flexible binding, pocket size. All details plainly brought out, this book is of extreme value to engineers, operators & students.

AUDELS WIRING DIAGRAMS.....$1

210 Pages. Illustrated. Gives practical facts on wiring of electrical apparatus. It shows clearly how to wire apparatus for practically all fields of electricity. Each diagram is complete & self-explanatory. Highly Endorsed Pocket Companion.

AUDELS PLUMBERS & STEAMFITTERS GUIDES—4 Vols. $6

A Practical Trade Assistant & Ready Reference. Explains in plain language & by clear illustrations, diagrams, charts, graphs, pictures principles of modern plumbing practice including Marine Pipe Fitting and Air Conditioning. 4 Vols.—1670 Pages—3642 Diagrams. Pocket size. Each Vol. Sold Separately $1.50 a Vol.

AUDELS SHEETMETAL WORKERS HANDY BOOK.....$1

Practical inside information. Fundamentals of Sheet Metal Work. 388 pages. Illustrated. 11 sections. Clearly written. Essential & important facts, figures, pointers in everyday language. Ref. Index.

AUDELS SHEETMETAL PATTERN LAYOUTS.....$4

Developed by Experts for Sheet Metal Workers, Layout Men & Mechanics. A Practical Encyclopedia in 10 Sections, size 7 x 10 x 2—1125 Pages—350 Layouts—1600 Illustrations. 1001 Key Facts. Fully indexed for ready reference in answering your layout problems. Covers all phases of sheet metal work including Pattern Cutting, Pattern Development & Shop Procedure.

AUDELS ANSWERS ON BLUE PRINT READING.....$2

For Mechanics & Builders. Covers all types of blue print reading including ship & airplane. 416 pages, fully illustrated.

AUDELS NEW MACHINIST & TOOLMAKERS HANDY BOOK.....$4

Covers modern machine shop practice in all its branches. 5 practical books in 1. New from cover to cover. Tells how to set up & operate lathes, screw and milling machines, shapers, drill presses and all other machine tools. 1600 pages, fully illustrated, 5 x 6½ x 2. Indexed. 5 sections. 1—Modern Machine Shop Practice. 2—Blue Print Reading & How to Draw. 3—Calculations & Mathematics for Machinists. 4—Shop Physics. 5—How to Use the Slide Rule. 60 chapters. Easy to read and understand. A shop companion that answers your questions.

AUDELS MATHEMATICS & CALCULATIONS FOR MECHANICS $2

Mathematics for home study or reference. 700 pages, 550 illus. Practical mathematics from beginning. How to figure correctly. Easy, correct methods covering complete review. Illus. & Indexed.

AUDELS HANDY BOOK OF PRACTICAL ELECTRICITY.....$4

For maintenance engineers, electricians & all electrical workers. 1440 Pages, 2600 Illus. Covers important electrical information in handy form—including Marine Wiring, Radio Principles, Welding. Indexed. A Key to a practical understanding of electricity.

AUDELS RADIOMANS GUIDE.....$4

A key to the practical understanding of radio including Frequency Modulation, Television, etc., Aircraft & Marine Radio. For radio engineers, servicemen, amateurs, 914 Pages, 633 Illustrations & Diagrams. Photos. Review Questions & Answers, Reference Index. Authentic, clear, concise.

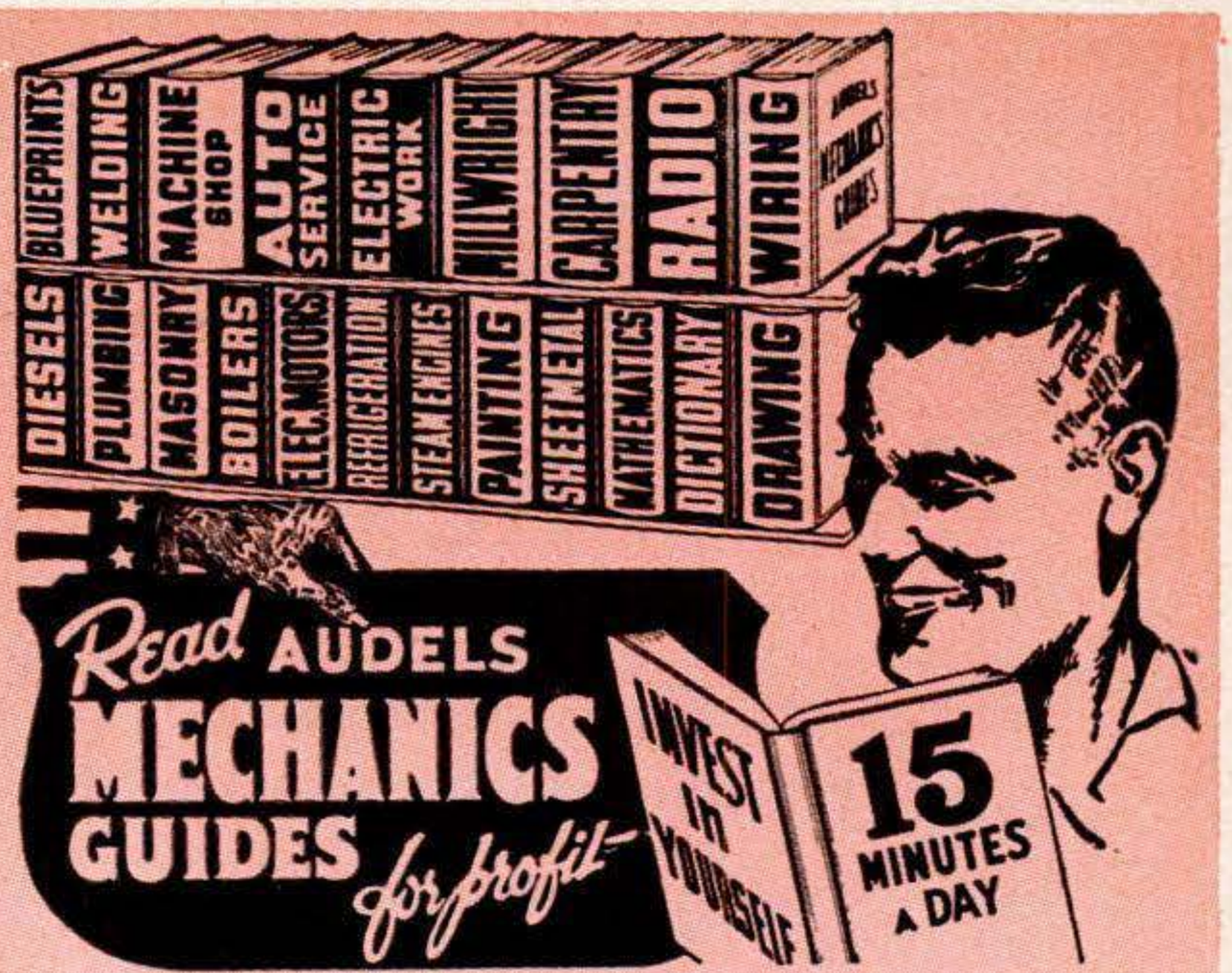
AUDELS ELECTRONIC DEVICES.....$2

Tells What You Want to Know About Electric Eye. Easily Understood. Covers photo-electric cells & their applications. Amplifiers, illumination, frequencies, voltage, photocell, tubes, Ohm's Law, wiring diagrams, etc.

AUDELS WELDERS GUIDE.....$1

A concise, practical text on operation & maintenance of all welding machines for all mechanics. Over 400 pages, illustrated. Covers all methods of electric and acetylene welding including airplane work.

AUDEL, Publishers, 49 W. 23 St., N. Y. 10



AN AUDEL GUIDE IS A GOOD FRIEND!

Step Up Your Own Skill with the Practical Facts and Figures of Your Trade. Save time and money with right methods, short cuts, labor saving ideas. CHECK NOW! You can look over any Audel Guide in your home. Start the Easy Payments if satisfied.

CUT HERE

MAIL ORDER

AUDEL, Publishers, 49 W. 23 St., New York 10, N. Y.

Please mail me for 7 days' free examination the books marked (X) below. I agree to mail $1 in 7 days on each book or set ordered, and to further mail $1 a month on each book or set ordered until I have paid purchase price. If I am not satisfied with Guides I will return them.

- ☐ Audels HOUSE HEATING GUIDE $4
- ☐ Audels ELECTRIC MOTOR GUIDE 4
- ☐ Audels OIL BURNER GUIDE 1
- ☐ Audels REFRIGERATION & Air Conditioning Guide . 4
- ☐ Audels POWER PLANT ENGINEERS GUIDE . . . 4
- ☐ Audels PUMPS, HYDRAULICS & AIR COMPRESSORS 4
- ☐ Audels WELDERS GUIDE 1
- ☐ Audels BLUE PRINT READING 2
- ☐ Audels SHEET METAL WORKERS Handy Book . . 1
- ☐ Audels SHEET METAL PATTERN LAYOUTS . . . 4
- ☐ Audels AIRCRAFT WORKER 1
- ☐ Audels MATHEMATICS and CALCULATIONS . . . 2
- ☐ Audels MACHINISTS & TOOLMAKERS Handy Book 4
- ☐ Audels MECHANICAL Dictionary 4
- ☐ Audels AUTOMOBILE GUIDE 4
- ☐ Audels DIESEL ENGINE MANUAL 2
- ☐ Audels MARINE ENGINEERS Handy Book 4
- ☐ Audels MECHANICAL DRAWING GUIDE 1
- ☐ Rogers MECHANICAL DRAWING and DESIGN . . 2
- ☐ Audels MILLWRIGHTS and Mechanics Guide . . 4
- ☐ Audels CARPENTERS and Builders Guides (4 vols.) . 6
- ☐ Audels PLUMBERS and Steamfitters Guides (4 vols.) 6
- ☐ Audels MASONS and Builders Guides (4 vols.) . . . 6
- ☐ Master PAINTER and DECORATOR 2
- ☐ Audels GARDENERS & GROWERS GUIDES (4 vols.) 6
- ☐ Audels ENGINEERS & FIREMANS EXAMINATIONS 1
- ☐ Audels ENGINEERS and Mechanics Guides (8 vols.) . 12
- ☐ Audels Answers on Practical ENGINEERING . . . 1
- ☐ Audels ELECTRICIANS EXAMINATIONS 1
- ☐ Audels WIRING DIAGRAMS 1
- ☐ Audels Handy Book of PRACTICAL ELECTRICITY . 4
- ☐ Audels ELECTRICAL POWER CALCULATIONS . . 2
- ☐ Audels ELECTRONIC DEVICES 2
- ☐ Audels ELECTRIC Dictionary 2
- ☐ Audels RADIOMANS GUIDE 4
- ☐ Audels NEW ELECTRIC LIBRARY at $1.50 a Volume Vols. I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII

*Name*_____

*Address*_____

*Occupation*_____

*Employed by*_____ PSM

Copyrighted material

What Strange Powers Did The Ancients Possess?

EVERY important discovery relating to mind power, sound thinking and cause and effect, as applied to self-advancement, was known centuries ago, before the masses could read and write.

Much has been written about the wise men of old. A popular fallacy has it that their secrets of personal power and successful living were lost to the world. Knowledge of nature's laws, accumulated through the ages, is never lost. At times the great truths possessed by the sages were hidden from unscrupulous men in high places, but never destroyed.

Why Were Their Secrets Closely Guarded?

Only recently, as time is measured; not more than twenty generations ago, less than 1/100th of 1% of the earth's people were thought capable of receiving basic knowledge about the laws of life, for it is an elementary truism that knowledge is power and that power cannot be entrusted to the ignorant and the unworthy. Wisdom is not readily attainable by the general public; nor recognized when right within reach. The average person absorbs a multitude of details about things, but goes through life without ever knowing where and how to acquire mastery of the fundamentals of the inner mind—that mysterious silent something which "whispers" to you from within.

Fundamental Laws of Nature

Your habits, accomplishments and weaknesses are the effects of causes. Your thoughts and actions are governed by fundamental laws. Example: The law of compensation is as fundamental as the laws of breathing, eating and sleeping. All fixed laws of nature are as fascinating to study as they are vital to understand for success in life.

You can learn to find and follow every basic law of life. You can begin at any time to discover a whole new world of interesting truths. You can start at once to awaken your inner powers of self-understanding and self-advancement. You can learn from one of the world's oldest institutions, first known in America in 1694. Enjoying the high regard of hundreds of leaders, thinkers and teachers, the order is known as the Rosicrucian Brotherhood. Its complete name is the "Ancient and Mystical Order Rosae Crucis," abbreviated by the initials "AMORC." The teachings of the Order are not sold, for it is not a commercial organization, nor is it a religious sect. It is a non-profit fraternity, a brotherhood in the true sense.

Not For General Distribution

Sincere men and women, in search of the truth —those who wish to fit in with the ways of the world—are invited to write for a complimentary copy of the sealed booklet, "The Mastery of Life." It tells how to contact the librarian of the archives of AMORC for this rare knowledge. This booklet is not intended for general distribution; nor is it sent without request. It is therefore suggested that you write for your copy to Scribe E. G Z.

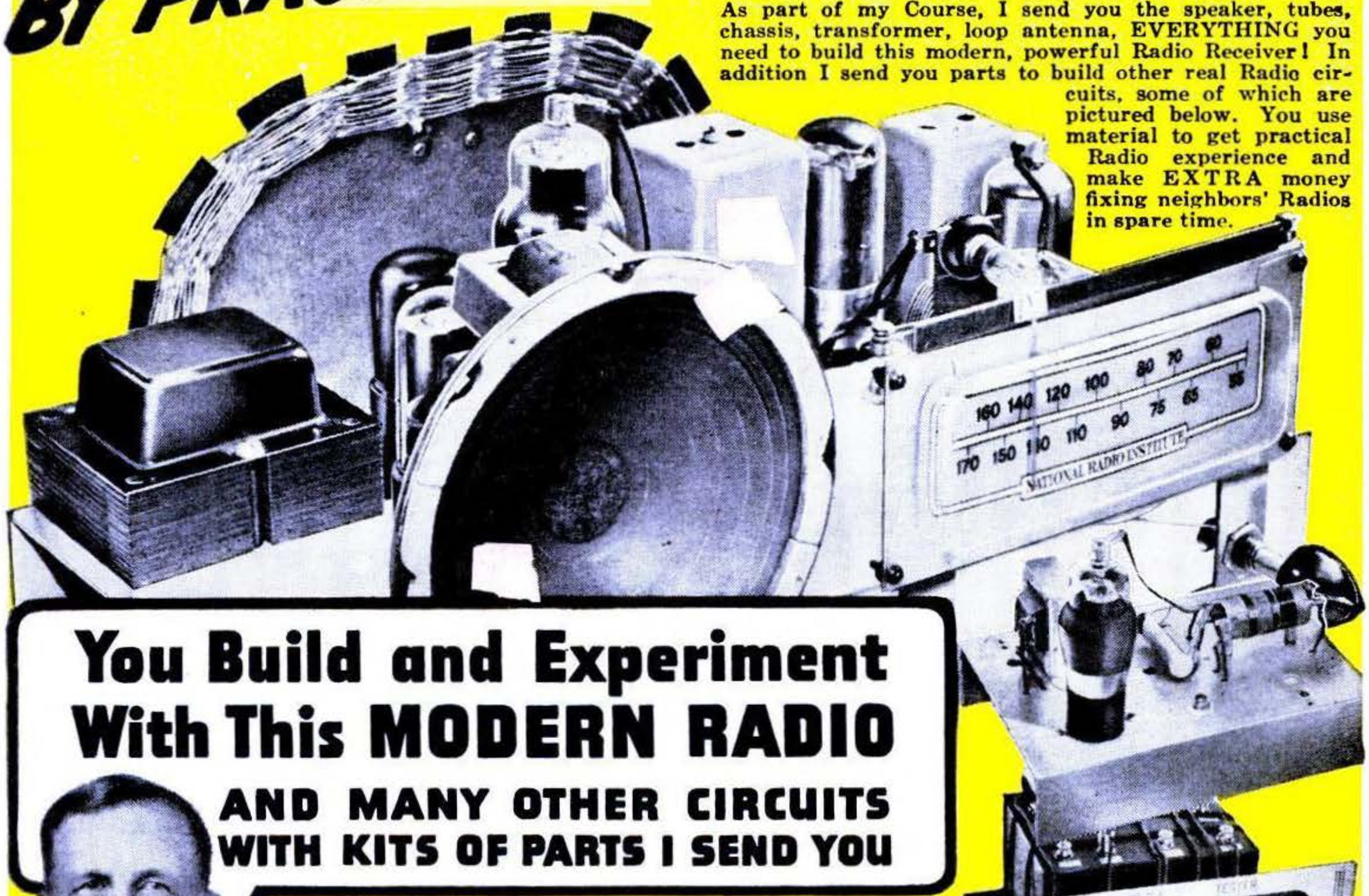
The ROSICRUCIANS
[AMORC]
San Jose California

Copyrighted material

LEARN RADIO

BY PRACTICING IN SPARE TIME

As part of my Course, I send you the speaker, tubes, chassis, transformer, loop antenna, EVERYTHING you need to build this modern, powerful Radio Receiver! In addition I send you parts to build other real Radio circuits, some of which are pictured below. You use material to get practical Radio experience and make EXTRA money fixing neighbors' Radios in spare time.



You Build and Experiment With This MODERN RADIO

AND MANY OTHER CIRCUITS WITH KITS OF PARTS I SEND YOU

J. E. SMITH, President
National Radio Institute

Want a good-pay job in the fast-growing Radio Industry—or your own Radio Shop? Mail coupon for Actual Lesson and 64-page book, "How to Be a Success in Radio-Television-Electronics." Both FREE! See how I train you at home—how you get practical Radio experience building, testing Radio circuits with BIG KITS OF PARTS I send.

Make EXTRA Money While Learning

The day you enroll I send EXTRA money manuals, show you how to make EXTRA money fixing neighbors' Radios in spare time. It's probably easier than ever to start now, because Radio Repair Business is booming. Trained Radio Technicians find profitable opportunities in Police, Aviation, Broadcasting, Marine Radio, Public Address work. Think of even greater opportunities as demand for Television, FM, Electronic Devices keeps growing!

SEE What NRI Can Do For You!

Mail Coupon for FREE Lesson and 64-page book. Read details about my Course, letters from men I trained about what they now earn. See how quickly, easily you can get started. No obligation! Mail Coupon in envelope or paste on penny postal. Send NOW!

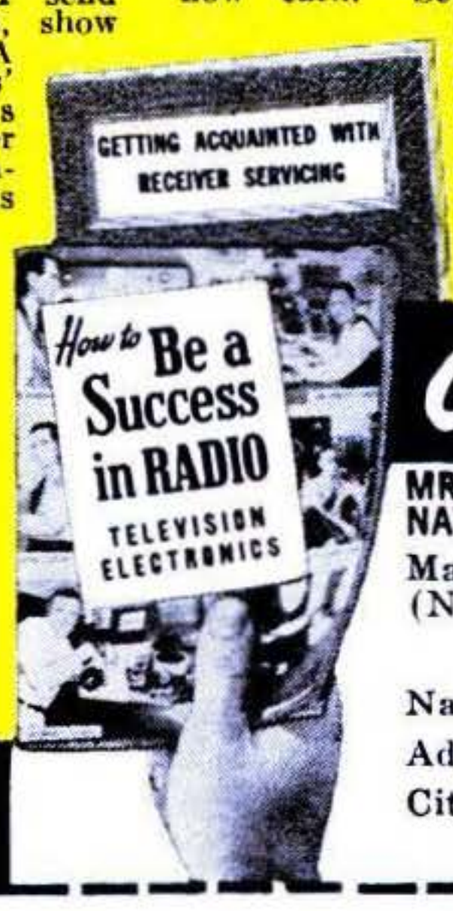
I TRAINED THESE MEN

"AM NOW GETTING $60 a week and overtime as Radio Serviceman for Hardaway Appliance Co."—W. A. ANGEL, Blythesville, Arkansas.

"KNEW NOTHING ABOUT RADIO when I enrolled. Now am doing spare time work. I have more than paid for my Course and about $200 worth of equipment."—RAYMOND HOLTCAMP, Vandalia, Ill.

VETERANS

You can get this training under G. I. Bill. Mail Coupon.



My Course Includes Training in
TELEVISION • ELECTRONICS
FREQUENCY MODULATION

Good for Both—FREE

MR. J. E. SMITH, President, Dept. 8FF3
NATIONAL RADIO INSTITUTE, Washington 9, D. C.
Mail me FREE, Sample Lesson and 64-page book. (No salesman will call. Please write plainly.)

Age .....

Name .....

Address .....

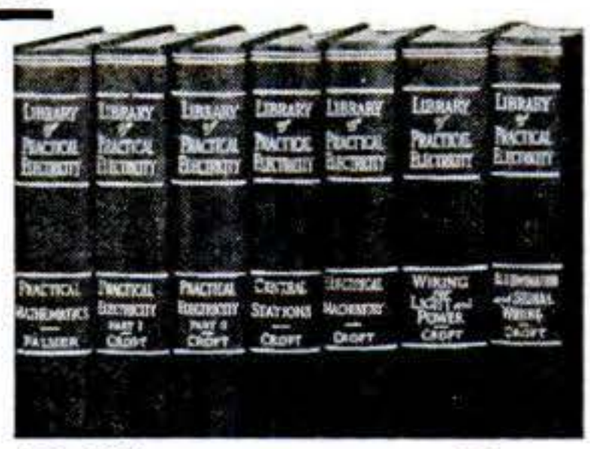
City ..... Zone ..... State .....

☐ Check if Veteran

Copyrighted material

Increasing your hold on your job and giving yourself a chance for advancement

Few men deliberately plan to work persistently on self-improvement. If progress comes naturally, they're happy; if it doesn't, they worry or ignore the situation. Yet it is possible to pay attention to self-improvement with considerable hope of success. A noticeable degree of advancement is practically *assured* any one who will make an intelligent and persistent effort. Thousands of men have proved this for themselves with:



The Croft Library of Practical Electricity

The Croft Library is a complete electrical educator. It is founded on practice—on 20 years of shirt-sleeve experience—on work as it is actually done. It is jammed from cover to cover with the kind of hard-headed facts you want. Written so that the beginner can easily understand it, yet so sound, so thorough, that it is the daily guide of 59,000 highly paid electrical workers and engineers. Croft tells you the things you need to know about motors, generators, armatures, commutators, transformers, circuits, switchboards, distribution systems—electrical machinery of every type—wiring for light and power—wiring of finished buildings—underwriters and municipal requirements—illumination in its every phase—the most improved methods of lighting lamps—and lamp effects, etc.—how to do a complete job, from planning it, to completion.

No money down—easy payments

Fill in and mail the coupon attached and we will send you the entire set of seven volumes for ten days' examination on approval. We take all the risk—you assume no obligation. If you decide to keep the books, send $3.50 in ten days and the balance at the rate of $4.00 a month. Send the coupon NOW and see the books for yourself.

McGRAW-HILL BOOK CO., 330 W. 42nd St., New York 18, N. Y.
Send me for ten days' examination on approval the Croft Library of Practical Electricity, 7 vols. If satisfactory I will send you $3.50 in 10 days and $4.00 monthly until the price of $19.50 is paid. If not wanted, I will return the books postpaid.

Name.....

Home Address.....

City and State.....

Company.....

Position ..... PSM—6-48

THE ONLY GENUINE WEBSTER IS THE

Merriam-WEBSTER

A century ago, G. & C. Merriam Company acquired the rights to publish Webster's Dictionary. Through the years, with each new edition, Merriam has constantly enlarged the scope and usefulness of Noah Webster's original work, until today the names MERRIAM and WEBSTER are equally important in identifying "The Supreme Authority." Ask for WEBSTER'S NEW INTERNATIONAL DICTIONARY, *Second Edition*—the great unabridged Merriam-Webster.

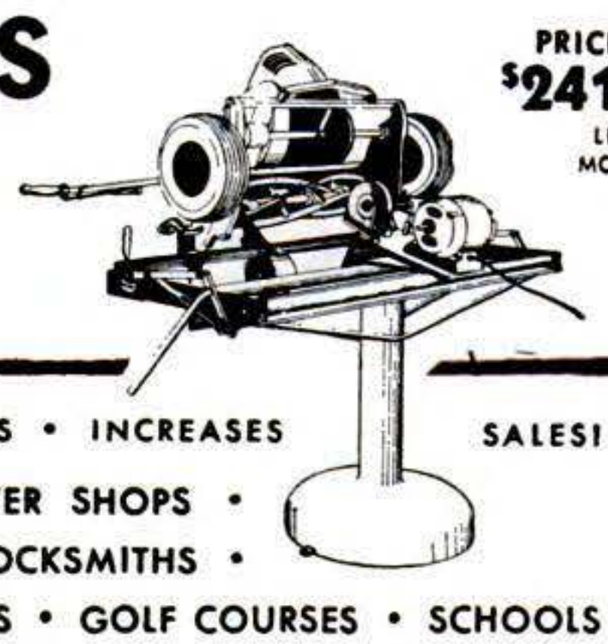
G. & C. MERRIAM CO., Springfield 2, Mass.

Buy Give-a-Book Certificates at Your Bookseller

"THE SUPREME AUTHORITY"

MODERN LAWN MOWER SHARPENER

PROFITS and SPEED



PRICE $241.50 LESS MOTOR

INCREASES PROFITS • INCREASES SALES!

FOR LAWN MOWER SHOPS • FIXIT SHOPS • LOCKSMITHS • HARDWARE STORES • GOLF COURSES • SCHOOLS PARKS • PLAYGROUNDS • INSTITUTIONS • CEMETERIES • AND ALERT INDIVIDUALS!

Sharpens All Reel Type Mowers • Hand, Power or Gang • 10 to 20 Minutes • No Dismantling No Extra Attachments Needed

All reel type mowers, from 5-inch edgers to 36-inch power mowers, are quickly sharpened to extreme ends of both left and right twist reel blades. Handle, wheels, roller and motor remain in place when sharpening is in process. Bed knife is sharpened in same brackets that hold mower in grinding position. No extra attachments required. One lever puts mower or bed knife in grinding position. 100% steel construction. Grinding head rides on five ball bearing races. Small, compact, easy to operate. Sharpens wood chisels, joiner knives and planer blades without extra attachments.

ORDER NOW Immediate Delivery

Skate Sharpener Attachment Available

Send For Free Bulletin No. 11B

MODERN MFG. CO. 160 N. FAIR OAKS AVE PASADENA 1, CALIFORNIA

Do you want

..to go to College?

..or to enter a Profession?

(Such as Accounting, Architecture, Nursing, Dentistry, Teaching, Social Work, Osteopathy, Beauty Culture, Optometry, Embalming, Chiropody, Law, Medicine, etc.)

..or get an Office Position?

To get anywhere, you practically MUST finish High School FIRST. You can complete our simplified High School Course in SPARE time at home, as FAST as your time and abilities permit. Equivalent to resident school work—prepares you for college, pre-professional examinations, business, industry. Standard texts furnished. Diploma. Credit for H.S. subjects already completed. Single subjects if desired. Low tuition, easy terms. American School, Chicago, est. 1897—endorsed by educators. Finish your high school education NOW. Write TODAY!

High School Course at Home

Many Finish in 2 Years

American School, Dept. HA46, Drexel Ave. at 58th St., Chicago 37

Gentlemen: Send me FREE information covering special training in subjects checked below. No obligation on my part.

- ☐ High School Course
- ☐ Electronics, Industrial
- ☐ Architecture and Building
- ☐ Automotive Engineering
- ☐ Business Management
- ☐ Electrical Engineering
- ☐ Elec. and Gas Refrigeration
- ☐ Air Conditioning
- ☐ Railway Training
- ☐ Diesel Engineering
- ☐ Drafting and Design for Men and Women
- ☐ Plastics
- ☐ Private Secretary
- ☐ Mechanical Engineering
- ☐ Aviation
- ☐ Salesmanship
- ☐ Radio

Name.....

Address.....

Copyrighted material

Choose one of these 2 GREAT FIELDS

– Get Ready QUICK at COYNE!

This big fire-proof building is occupied entirely by Coyne.

Prepare for Success Quickly . . . in the

GREAT SHOPS OF COYNE

Conditions today are different. Many "one-operation" jobs that pay well will not last. Plan for steady pay and advancement by training NOW. Come to the great shops of COYNE in Chicago, for "all-around" training in **Electricity or Radio-Television**—the 2 great opportunity fields.

NOT "HOME-STUDY" COURSES

Our famous **"Learn-by-Doing"** method gives you practical experience on a massive outlay of equipment. Not by correspondence, but actual shop work plus necessary theory. You are trained right here in the great **Coyne** shops that has been training men and young men for over 49 years.

ELECTRICITY

INCLUDING INDUSTRIAL ELECTRONICS

Big future in Power Plant Work, Motors, Armature Winding, Home and Factory Wiring, Appliances, Refrigeration, Maintenance, Illumination, etc. Electricians are in demand everywhere —lifetime job service to Coyne graduates. Send for BIG FREE BOOK.

RADIO TELEVISION and F.M.

A great field now, even greater growth ahead. Here at COYNE you're trained for Construction, Testing, Trouble-Shooting on Radio, Public Address, Sound Picture Units. Training includes FM, Photo-cells, Television, etc. Our training is quick, easy, practical. Many **Coyne** trained men own well-paying radio businesses of their own.

ELECTRIC REFRIGERATION

Added training in Electrical Refrigeration now included with either our Electrical or Radio Course.

NON-VETERANS who are short of cash can finance most of their tuition and pay in easy monthly payments after graduation. Many earn while learning.

VETERANS

COYNE is authorized to train those who qualify for training under G. I. Bill of Rights. Coupon brings Special G.I. Bulletin.

LARGEST, OLDEST, BEST EQUIPPED SCHOOL OF ITS KIND IN THE U.S.

Pick Field You Like —Mail Coupon for Big FREE Book

Whether you prefer Electricity, or Radio, train on actual equipment, at **Coyne.** We have a big, fully illustrated book on each course, and we'll send you the one you want, without obligation. Mail coupon — TODAY.

B. W. COOKE, President
COYNE ELECTRICAL AND RADIO SCHOOL
500 S. Paulina St., Dept. A8-73H, Chicago 12, Ill.

Send me your BIG FREE BOOK — **for the course checked below.** This does not obligate me and no salesman will call.

☐ ELECTRICITY ☐ RADIO—TELEVISION

NAME.....

ADDRESS.....

CITY.....STATE.....

Founded 1899 **B. W. COOKE, President**

COYNE ELECTRICAL AND RADIO SCHOOL

500 So. Paulina Street, Dept. A8-73H, CHICAGO 12, ILL.

Copyrighted material

GET THESE 2 BIG BOOKS FREE..

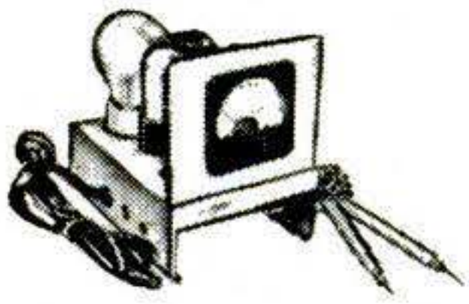
IF YOU WANT TO LEARN RADIO!

FRANK L. SPRAYBERRY
famous Radio teacher of hundreds of successful Radio men.

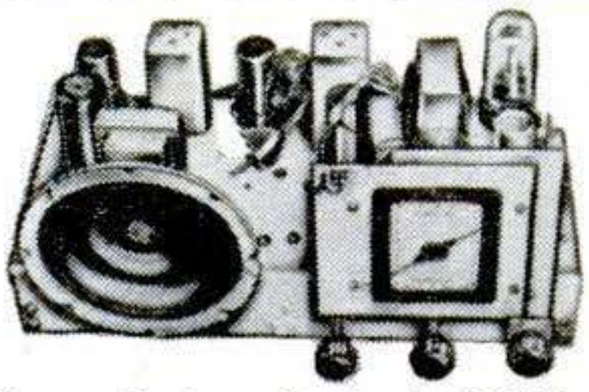
I Train You RIGHT by Sending You 8 BIG KITS of Radio Equipment *including* A POWERFUL 6 TUBE SUPERHET RECEIVER *and* 16 RANGE TEST METER!

Find out NOW how Sprayberry Training prepares you for a Radio Service Business of your own — or a good pay Radio job. Just mail the coupon for a FREE Sample Lesson and my big FREE book, "How To Make Money In Radio, Electronics, Television." I train you at home during spare hours by putting you to work building, testing, repairing, working with 8 big kits of Radio parts I supply. You build a powerful 6 tube superhet Radio, a 16-range test meter, perform over 175 interesting, practical experiments. My lessons are easy and interesting . . . you need no previous experience in Radio. My famous *Business Builders* help you earn EXTRA CASH getting and doing neighborhood Radio Service jobs while learning. You couldn't pick a better time to get into Radio. Good Radio Service and Repair Shops are needed everywhere as millions of new sets are in use. Trained men are wanted for opportunities in Police, Aviation and Marine Radio, F.M., Standard Broadcasting and Television. Mail coupon today for my FREE Books.

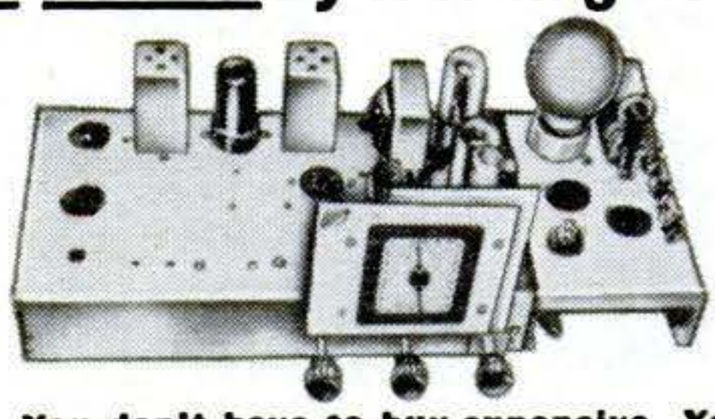
LEARN HOW TO BUILD-TEST-REPAIR RADIOS *By Working with* YOUR HANDS!



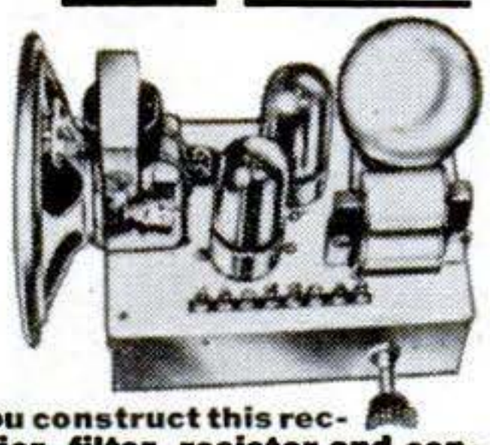
I give you a fine, moving coil type Meter—with parts for a complete analyzer and Circuit Continuity Tester. "Trouble-shoot" with professional accuracy.



You really learn Radio the PRACTICAL way . . . when you build this big, powerful 6-tube Superhet Radio from parts I send you.



You don't have to buy expensive ready-made equipment. You get valuable experience building this Signal Generator and Multi-purpose Tester.



You construct this rectifier, filter, resistor and condenser tester, and really get on the Practical end of Radio.

Trained Radio men can step into their own profitable Radio Service Shop—or

New developments constantly open new big pay job opportunities in Radio.

LOW COST RADIO TRAINING STUDY AT HOME IN SPARE HOURS

Easy monthly payments, if desired. Everything you need is furnished - nothing else to buy. The equipment I send you is yours "for keeps"—to use in your business or job. I have trained hundreds of successful Radio men — and I can help you, too. Get the facts about Sprayberry Training—it's your first step to success, security and a bigger income. Fill out and mail coupon today. I'll rush my 2 Free books to you by return mail.

VETERANS: Approved for G. I. Training under Public Laws 16 and 346.

SPRAYBERRY ACADEMY of RADIO
F. L. SPRAYBERRY, President
Room 5568, Sprayberry Bldg., Pueblo, Colorado

RUSH COUPON *Today!*

SPRAYBERRY ACADEMY OF RADIO
F. L. SPRAYBERRY, President
Room 5568, Sprayberry Bldg., Pueblo, Colorado
Please rush my FREE copies of "How To Make Money In Radio, Electronics and Television" and "How To Read Radio Diagrams and Symbols." No salesman will call.

*Name*_____ *Age*_____

*Address*_____

*City and Zone*_____ *State*_____

☐ CHECK HERE IF A VETERAN
(Mail in an Envelope or Paste on Penny Postcard)

Copyrighted material

INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the U. S. Patent Office. For that reason, the Patent Office advises the inventor, unless he is familiar with such matters, to engage a competent registered patent attorney or agent to represent him. We maintain a staff of registered patent attorneys ready to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

Registered

Patent

Attorneys

CLARENCE A. O'BRIEN & HARVEY B. JACOBSON
Registered Patent Attorneys
82-F District National Bldg., Washington 5, D. C.

Please send me copy of "Patent Guide for the Inventor" and also "Record of Invention" form. This request does not obligate me.

Name_____

Address_____

City_____ **State**_____

(Please write or print plainly.)

CLARENCE A. O'BRIEN & HARVEY B. JACOBSON

82-F District National Building + Washington 5, D. C.

Copyrighted material

WAR SURPLUS VALUES

Air Corps SUNGLASSES

New Air Corps Type. 24 Karat gold plated frame. 4 base optically ground lens. Pearloid brow rest. Complete with case.

2.25

Jungle HAMMOCK

Brand New. Mosquito proof, rain-proof, mildew-proof nylon. Use as hammock or tent.

5.95

Full length zipper opening.

SLEEPING BAG

100% wool, mummy type. 30" zipper. Reissue — guaranteed like new. Complete with water repellent cover.

3.95

NAVY T-SHIRT

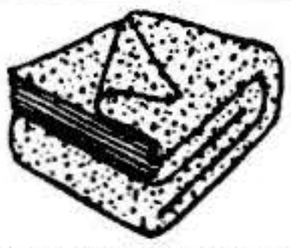
Brand New. First quality. Soft fine knit cotton. Sizes small, med., large.

3 for $2

CANVAS BUCKET

New Army surplus collapsible canvas bucket. Heavy double wall construction. 8 qt. capacity.

49c



ARMY BLANKET

Guaranteed perfect condition — like new. No holes, tears, or repairs. 100% wool, full size, OD color.

3.88

ARMY PUP TENT

Army surplus Full size. Used—guaranteed perfect condition. Complete with poles and pins.

3.95

ORDER FROM THIS AD

GOOSENECK FLASHLIGHT

Brand New. Gov't. surplus. For mechanics, electricians, and home use. 12" extension adjustable to any angle. Water and shockproof. With extra bulb.

1.39

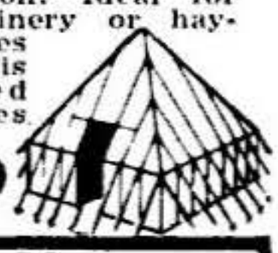
FOOTLOCKER

New Army type metal footlocker with 2 drawbolt hasps and center lock with key. Metal bumper corners. Removable tray. (This item shipped freight charges collect.

9.95 (Plus 20% Fed. tax)

PYRAMIDAL TENT

Heavy canvas. Full size 16x16 feet. Used — guaranteed perfect condition. Ideal for covering machinery or haystack. No poles or pins. (This item shipped freight charges collect.)



34.50

Used Army FIELD JACKET

Completely renovated — guaranteed serviceable. Water repellent poplin, 100% wool flannel lining. Zipper button front. 34, 36, 38.

1.88

New Navy FIELD JACKET

Water repellent poplin with 100% wool flannel lining. Zipper and button front. Sizes 34, 36.

5.95

NAVY KNIFE

Brand New. Tempered steel 5½ inch "Parkerized" blade. Laminated leather grip handle.

Complete with sheath.

$1

MILITARY TYPE WRIST WATCH

Brand New Fully guaranteed 17 jewel movement. Luminous radium dial. Stainless steel back. Waterproof, anti-magnetic. Genuine pigskin leather strap.

21.95 Plus 10% Fed. tax

Send check or cash—Shipped prepaid unless otherwise noted. COD's sent postage collect.

NATIONAL JOBBING COMPANY
1703 No. 24th St. Dept. S. Omaha, Nebr.

Letters

"Why Hurry for that Harp?"

Sir:

The article "Good Driving Is a Habit" by Devon Francis and John F. Stearns in the March issue is excellent. The so-called illustrated statistic on the front cover and the two pages of colored pictures showing troublemakers should cause a lot of serious thinking.

Best of all we liked the Seven Keys to Safety but feel that two more keys could be added with excellent results. One is to know the meaning of the basic shapes of highway signs. It is surprising how many do not know these so that they may start compliance before they can read the lettering on the sign. The other suggestion would be simply to say that before crossing railroad tracks be certain the tracks are clear *both* ways.

These are important because each year an average of 1875 people are killed and 4700 injured because of collisions between trains and motor vehicles. . . .

D. E. Mumford

New York Central System
New York, N. Y.

In its recently published pamphlet on public safety—"Why be in a Hurry for that Harp?"—the New York Central sums up this good advice in the following three suggestions: "1. Heed the highway signs. They're there to help you—protect you! 2. Slow down for highway and railroad crossings—so that you can always stop, if necessary. You may never get a second chance. 3. At all railroad crossings, look and listen. Before starting across, be certain the tracks are clear both ways. Gambling with death is the poorest gamble in this world—and the quickest way to get into the next world. Don't be in a hurry for that harp! Lose a second and save a life—your life."

It Can Still Happen to You

Sir:

. . . You describe the cover illustration on the March issue as showing a situation comparable to a head-on collision at 30 m.p.h. To be sure, the car would be traveling 60 m.p.h. when it reached the ground,

Copyrighted material

INVENTORS

patent laws encourage the development of inventions

The Rules of Practice of the U. S. Patent Office advise—unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent, as the value of patents depends largely upon the skillful preparation of the specifications and claims.

The firm of McMorrow, Berman and Davidson is registered to practice before the U. S. Patent Office. Additionally, it maintains a staff of attorneys able to readily understand inventors' disclosures, to advise concerning patentability, and to prepare appropriate specifications and claims for filing with the Patent Office.

If an inventor believes he has an invention, a search of the most pertinent prior U. S. patents should be made and a report obtained relative to its patentability. Where such report indicates that the invention appears patentable, in order to secure protection, diligence should be exercised in making application for a patent.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS • TRADE MARKS • COPYRIGHTS

142-H VICTOR BUILDING, WASHINGTON 1, D. C.

McMORROW, BERMAN & DAVIDSON
Registered Patent Attorneys
142-H Victor Building, Washington 1, D. C.

Send me further particulars as to patent protection and procedure and "Invention Record" form at once. I understand that this request does not obligate me.

Name_____

Address_____

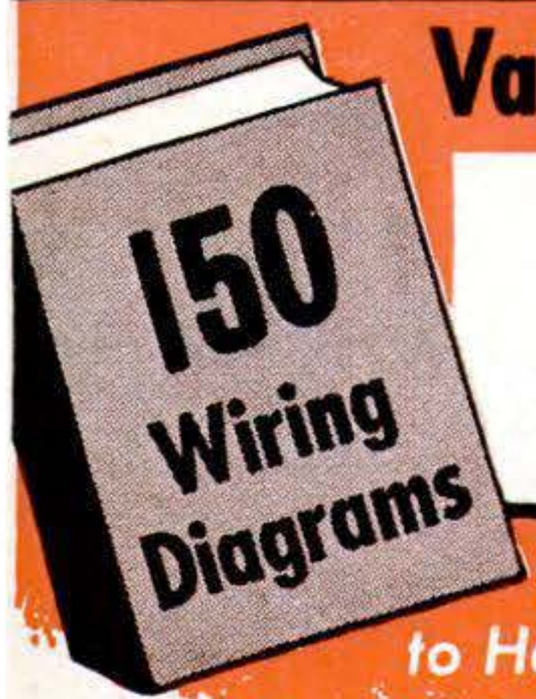
City_____ State_____

(WRITE OR PRINT NAME CLEARLY)

Copyrighted material

ELECTRICIANS! RADIO MEN!

Valuable BOOK FREE



It's My Gift to Help You Get Ahead

B. W. COOKE, *Dir.*

HERE'S one of the greatest "get acquainted" offers ever made. This valuable book of 150 selected Electrical Shop Prints and Wiring Diagrams is YOURS—absolutely FREE. It is 'chuckfull' of charts, diagrams, wiring methods and instructions for reading and using wiring prints. All are full size 8½" x 11" with full explanatory information.

5 to 1 Satisfaction GUARANTEE

I personally guarantee that at the end of 1 year from the date you receive these books that they must have earned 5 times their cost or you may return them and I'll refund every cent you paid.

YOU GET THIS FREE BOOK FOR MERELY EXAMINING COYNE'S New 8 Volume Set

All you do is let me send you my complete new 8 volume set of electrical books—APPLIED PRACTICAL ELECTRICITY—for 7 days' FREE Examination. Here's a set of books written especially for men in electrical work who want to get ahead.

The 8 volumes contain thousands of "show how" examples and photos—Electricity from A to Z right up-to-date in practical, *easy-to-understand* language ideal for self study, fully indexed for quick reference.

2500 QUESTIONS & ANSWERS BOOK INCLUDED

With the Set I'll include an extra *250*-page book containing 2500 questions and answers—130 *separate examinations*—the same type of examinations used by industrial firms to select men for better, bigger pay electrical jobs.

This sensational 2500 Electrical Question & Answer Book gives you the confidence that comes with knowing more about all branches of Electricity. That's what is needed today to "go places" in this.

SEND NO MONEY—If you act promptly, I'll send you the complete Set and the Question and Answer Book at my risk, postpaid for 7 days' FREE Examination . . . together with the 150 Shop Prints Book. Look the Set over for 7 days. If you like it, send either $24.25 cash, or $3 in 7 days and $3 a month until $25.50 is paid. If you don't want the set, return it at Coyne's expense and YOU OWE NOTHING. Either way you keep the Shop Prints Book as my FREE Gift.

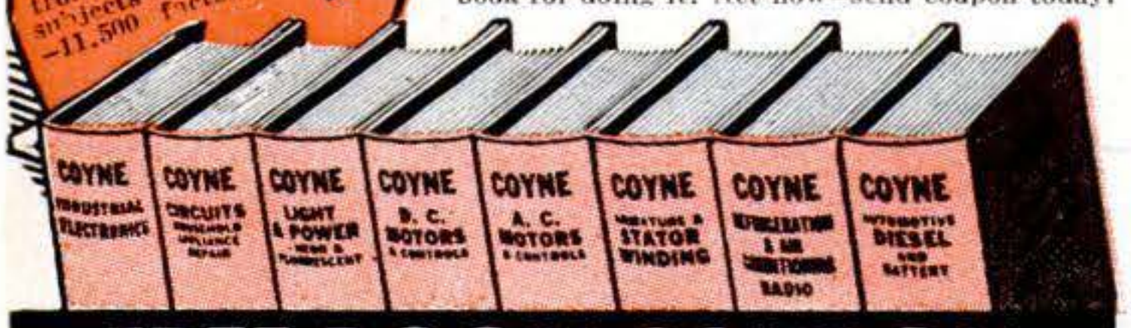
8 AMAZING VOLUMES

Covers everything—Home Wiring, Motors to Ind. Electronics. Over 3,400 subjects—2200 illus.—11,500 facts.

Coupon is Not an Order

Just a Request to See the Books FREE

When you send the coupon you are merely asking to see the books free and get my gift book for doing it. Act now—send coupon today!



FREE BOOK COUPON

B. W. Cooke, Pres., COYNE ELECTRICAL & RADIO SCHOOL
500 S. Paulina St., Dept. A6-R8, Chicago 12, Ill.

Yes, send me the NEW Coyne 8-Volume Set, APPLIED PRACTICAL ELECTRICITY, and your Question & Answer Book for 7 days' FREE Examination per your offer. Also send the bound volume of 150 Shop Prints which I am to keep FREE whether or not I keep the Set and Quiz Book.

Name.....Age.....

Address.....

Town.....Zone....State.....

and the actual speed of collision of the two cars would also be 60 m.p.h., but striking the ground, which is practically immovable, and striking another car are two different things. Actually a head-on collision at 30 m.p.h. is about the same as striking an immovable obstruction such as the ground at 30 m.p.h., for in each case the car's forward progress would be instantaneously stopped. . . .

So I suggest that your illustration shows a head-on collision at 60 m.p.h. for each car, while the 30-m.p.h. collision would be comparable to a 30-foot drop, about a three-story building.

. . . My desire to drive off a three-story building is little stronger than that for driving off one of nine stories, and looking at your picture makes me wonder if I ever want to drive 60 again, so even though in error it still makes a very good point.

RAYMOND C. THUROW

Madison, Wis.

Sir:

. . . May I suggest that your error may be in your conception of a collision? . . . If two cars . . . traveling at the same speeds in opposite directions collide, each car exerts the necessary equalizing force. Clearly two cars striking each other at a speed of 30 m.p.h. receive only as much damage as if they had hit a viaduct or fallen from 30.25 feet, or about three stories. . . .

HAROLD J. ANDERSON

Flint, Mich.

In its enthusiasm to make a point, PS was led slightly beyond the realm of ordinary physics. But even corrected figures don't make much difference—unless you figure you'll only be half as dead. Since most highway speeders operate closer to 60 m.p.h. than 30, PS's cover is still grimly realistic. Smashing into a car at 60 is the same as hurtling off a nine-story building—and who wants to do either?

Good Driving Gets Around

Sir:

. . . Praise to authors Devon Francis and John F. Stearns on their splendid article of safety, "Good Driving Is a Habit."

The Sacramento Police Department, Traffic Division, headed by Chief P. J. Bennett, asks permission to use part of this story and, if possible, to secure a cut, mat,

Copyrighted material

PATENT PROTECTION *for* INVENTORS

A PATENT IS A VALUABLE RIGHT

On the basis of a constitutional provision Congress has established a system under which inventors may secure the exclusive right to prevent the unauthorized use, manufacture and sale of their inventions for periods of seventeen years. The inventor secures this protection by obtaining a patent from the United States Patent Office.

THE United States Patent Office recommends in its Rules of Practice that "an applicant is advised, unless familiar with such matters to employ a competent registered patent attorney or registered patent agent, as the value of patents depends largely upon the skillful preparation of the specifications and claims."

WE recommend that you authorize us to conduct a search through the U. S. Patents pertinent to your invention and submit a report setting forth our opinion regarding its patentability.

Victor J. Evans & Co. has a staff of experienced registered patent attorneys, available to represent inventors in the preparation and prosecution of their cases before the Patent Office. Detailed information and the steps to be taken in obtaining patent protection will be furnished upon request.

FORM BELOW FOR MAILING CONVENIENCE

VICTOR J.
EVANS & CO.

Merlin M. Evans
REGISTERED PATENT ATTORNEY
340-F Merlin Building, Washington 6, D. C.

Please forward to me detailed information regarding procedure to obtain Patent Protection, together with your convenient "Evidence of Invention" form.

Name.....

Address.....

City and State.....

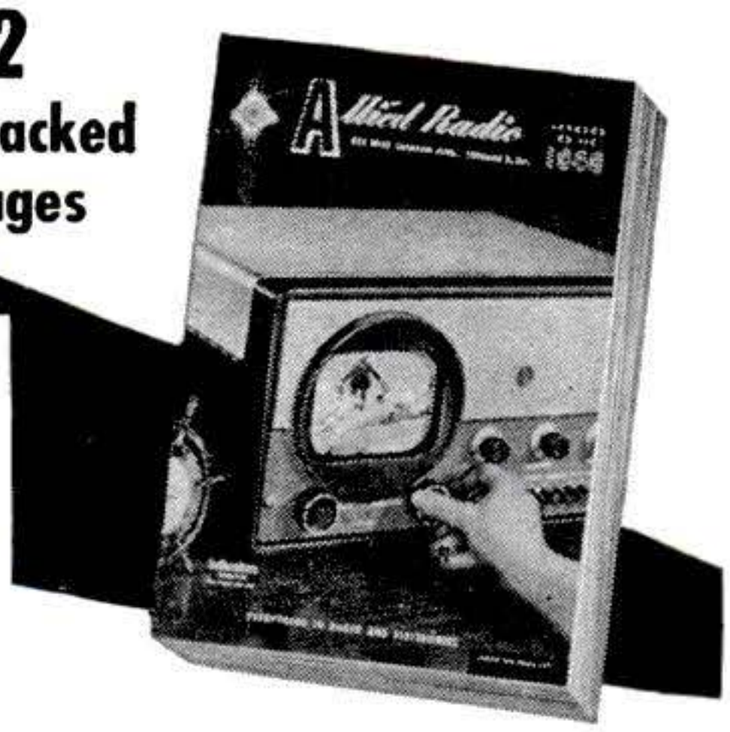
PATENTS • • • • TRADEMARKS • • • • COPYRIGHTS

Copyrighted material

FREE *get it now*

ALLIED'S NEW 1948 RADIO CATALOG!

172 Value-Packed Pages



EVERYTHING IN RADIO AT LOWEST PRICES

TELEVISION AND NEW HOME RADIOS

SERVICE SUPPLIES
BUILDERS' SUPPLIES

AMATEUR GEAR

SOUND SYSTEMS

Radio's Great Buying Guide

Send today for your FREE copy of Radio's Leading Catalog! It's the preferred Buying Guide for Servicemen, Dealers, Engineers, Soundmen, Amateurs, Builders and Experimenters. Shows everything you want in Radio and Electronic equipment—all the newest releases—complete, highest quality stocks at low, low prices that save you money on every purchase!

World's Largest Stocks!

You'll find *everything* in the new 172-page ALLIED Catalog—television receivers, latest home radios and radio-phonos, Ham receivers and station equipment, test instruments, public address equipment, new builders' kits, thousands of parts, tubes, tools, radio books, diagrams. Get the speedy, reliable service and expert help you want from ALLIED—Radio's Largest Supply House! Be sure to send today for your FREE copy of ALLIED'S new 1948 Buying Guide!

ALLIED RADIO

ALLIED RADIO CORP.
833 W. Jackson Blvd., Dept. 7-F-8
Chicago 7, Illinois

FREE CATALOG

☐ Rush FREE 1948 ALLIED Catalog

Name.....

Address.....

City.....Zone.....State.....

or picture of the layout on "Seven Keys to Safety" that ran in this issue. It would be of immense aid for our local publicity in furthering our present traffic safety campaign which is now in effect. . . .

H. D. MEREDITH

Department of Police
Sacramento, Calif.

Sir:

I would like permission to reproduce some material from an article in the March issue of POPULAR SCIENCE for the benefit of drivers at this base.

The article is "Good Driving Is a Habit," by Devon Francis and John F. Stearns. . . .

SGT. CARL F. POMMER, USAF

Office of the Ground Safety Officer H. Q.
Fort Slocum, N. Y.

PS is proud to take part in such a worthy cause and is sending full reprint permission both to the Sacramento Police Department and Sergeant Pommer at Fort Slocum.

Common-Sense Science

Sir:

Just read the March, 1948, issue of PS. Leo Selty's letter, pages 18 and 20, was a stinker. I suppose, if he was working in a cramped space and his wrenches did not fit the bolts and nuts in a "properly applied manner," he'd leave the nuts loose. . . . Common sense should tell a man to use a wrench the way it fits best—using care not to strain it, the nut, or himself. . . .

T. E. DICKERSON, MM 3/c, USN

U. S. S. Fresno, New York, N. Y.

Galileo Right, PS Wrong

Sir:

Really, I'm surprised at you! In your February "I'd Like to See Them Make" page you accepted the suggestion that a weighted cap on a fountain pen would make the cap hit the floor first when dropped.

Since when has weight affected the velocity of a freely falling object? Velocity is the function of gravity acceleration and time only, omitting aerodynamics, which would be negligible in this case.

ROBERT KING

Inglewood, Calif.

Sir:

. . . Your magazine is supposed to be

Copyrighted material

There's BIG MONEY in ADVERTISING!

Don't waste your creative ability in uncongenial work! With I.C.S. training you can put your talent to work in advertising.

The I.C.S. Advertising Course covers the whole of this richly rewarding field. Here's instruction in writing advertisements for publication in national magazines. You learn about display, illustration, type.

"Specialty" subjects are included... retail and department store advertising, advertising letters, catalogs, booklets, folders, "house organs."

In many cases, I.C.S. students take positions before they have completed their courses. They make good in the world of advertising because they have learned by DOING.

Mark and mail the coupon for full information. Do it now!

INTERNATIONAL CORRESPONDENCE SCHOOLS

ICS

BOX 7608-M, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Business and Academic Courses
- ☐ Accounting
- ☐ Advertising
- ☐ Arithmetic
- ☐ Bookkeeping
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Certified Public Accounting
- ☐ Commercial
- ☐ Commercial Art
- ☐ Cost Accounting
- ☐ Federal Tax
- ☐ First Year College
- ☐ Foremanship
- ☐ French
- ☐ Good English
- ☐ High School
- ☐ Higher Mathematics
- ☐ Motor Traffic
- ☐ Postal Service
- ☐ Salesmanship
- ☐ Secretarial
- ☐ Sign Lettering
- ☐ Spanish
- ☐ Stenography
- ☐ Traffic Management

Air Conditioning and Plumbing Courses
- ☐ Air Conditioning
- ☐ Heating
- ☐ Plumbing
- ☐ Refrigeration
- ☐ Steam Fitting

Chemistry Courses
- ☐ Chemical Engineering
- ☐ Chemistry, Analytical
- ☐ Chemistry, Industrial
- ☐ Chemistry, Mfg. Iron & Steel
- ☐ Petroleum Refining
- ☐ Plastics
- ☐ Pulp and Paper Making

Civil Engineering, Architectural and Mining Courses
- ☐ Architecture
- ☐ Architectural Drafting
- ☐ Building Estimating
- ☐ Civil Engineering
- ☐ Coal Mining
- ☐ Contracting and Building
- ☐ Highway Engineering
- ☐ Lumber Dealer
- ☐ Reading Structural Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Drafting
- ☐ Structural Engineering
- ☐ Surveying and Mapping

Communications Courses
- ☐ Electronics
- ☐ Practical Telephony
- ☐ Radio, General
- ☐ Radio Operating
- ☐ Radio Servicing
- ☐ Telegraph Engineering

Electrical Courses
- ☐ Electrical Drafting
- ☐ Electrical Engineering
- ☐ Electric Light and Power
- ☐ Lighting Technician
- ☐ Practical Electrician
- ☐ Power House Electric
- ☐ Ship Electrician

Internal Combustion Engines Courses
- ☐ Auto Technician
- ☐ Aviation
- ☐ Diesel-Electric
- ☐ Diesel Engines
- ☐ Gas Engines

Mechanical Courses
- ☐ Aeronautical Engineer's, Jr.
- ☐ Aircraft Drafting
- ☐ Flight Engineer
- ☐ Forging
- ☐ Foundry Work
- ☐ Heat Treatment of Metals
- ☐ Industrial Engineering
- ☐ Industrial Metallurgy
- ☐ Machine Shop
- ☐ Machine Shop Inspection
- ☐ Mechanical Drafting
- ☐ Mechanical Engineering
- ☐ Mold-Loft Work
- ☐ Patternmaking—Wood, Metal
- ☐ Reading Shop Blueprints
- ☐ Sheet-Metal Drafting
- ☐ Sheet-Metal Worker
- ☐ Ship Drafting
- ☐ Ship Fitting
- ☐ Tool Designing
- ☐ Toolmaking
- ☐ Welding—Gas and Electric

Railroad Courses
- ☐ Air Brake
- ☐ Car Inspector
- ☐ Diesel Locomotive
- ☐ Locomotive Engineer
- ☐ Locomotive Fireman
- ☐ Railroad Section Foreman

Steam Engineering Courses
- ☐ Boilermaking
- ☐ Combustion Engineering
- ☐ Engine Running
- ☐ Marine Engineering
- ☐ Steam Electric
- ☐ Steam Engines

Textile Courses
- ☐ Cotton Manufacturing
- ☐ Rayon Weaving
- ☐ Textile Designing
- ☐ Woolen Manufacturing

Name_____ Home Address_____

City_____ State_____

Age_____ Present Position_____ Working Hours_____ A.M. to_____ P.M.

Special tuition rates to members of the Armed Forces. Special discount to World War II Veterans.
Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

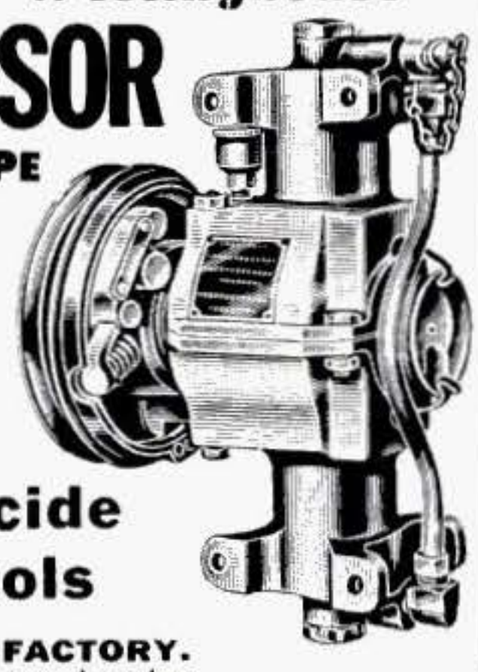
Copyrighted material

GROBAN'S SURPLUS BARGAINS!

War Surplus Bargain Special!

Brand New—Genuine Westinghouse

AIR COMPRESSOR



2 CYLINDER PISTON TYPE

IDEAL FOR

- Paint Spraying
- Industrial Uses
- Tire Inflating
- Spraying Insecticide
- Operating Air Tools

FOR THE HOME . . . FARM . . . FACTORY.
Designed for automotive truck or tractor mounting. Can be run off fan belt or power takeoff. Comes with automatic clutch. Can be installed for use on: farm trucks, jeeps, tractors, tire or garage service trucks, contractor or road building machinery, pneumatic devices, etc. 2" Bore . . . 1½" Stroke. Can be operated with ½ H.P. or more electric motor or equivalent portable gas engine.
Light weight, compact and versatile unit . . . delivers "oil free air" . . . simple in operation; requires minimum of maintenance; operates under all climatic conditions; suggested operating pressure 75 P.S.I.; equally efficient operation in either direction of rotation; approx. displacement 3.27 CFM at 600 RPM. 6.54 CFM displacement at 1200 RPM; Overall dimensions: width 9", height 11⅞", depth 6⅝"; approx. wt. 23 lbs.

A REAL BUY . . . worth many times this price ..... $26.95 F.O.B. Chicago

Send check or money order today.
SATISFACTION GUARANTEED.

REGO REGULATORS

Underwriters Approved

Oxygen—Model 1601

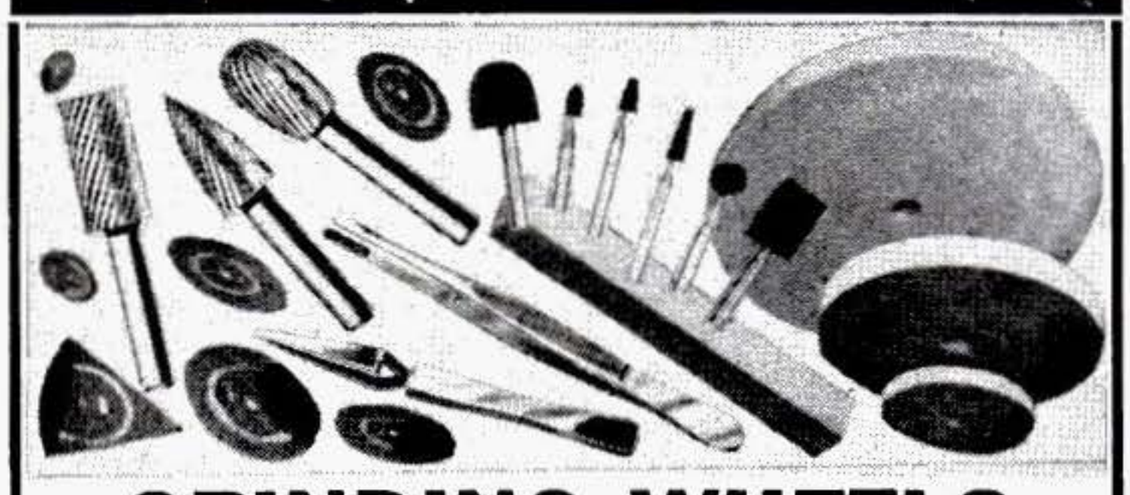
INLET 967

BRAND NEW

FOR THE WORKSHOP—HOME—FACTORY—FARM. Designed for precision, gas pressures; meet the heavy demands of cutting and welding in shops, ship and scrap yards, mills, etc. REGO REGULATORS deliver an ample supply of gases at constant, even pressures.
Manufactured by Bastian-Blessing Company. This highly dependable, accurate instrument is modern in design—diaphragms are 2⅝" in diameter; two brass gauges are each 2½" in diameter; 0-400 P.S.I. and 0-3000 P.S.I. Ship. wt. 7 lbs. .....

ORIGINALLY WORTH MANY TIMES MORE ..... $12.95 F.O.B. Chicago

GROBAN SUPPLY CO.
DEPT. PS-6, 1507 S. MICHIGAN AVE., CHICAGO 5, ILLINOIS



GRINDING WHEELS

Actually Worth $50.00

A wonderful buy! 350 pieces incl. 35 ass't. Grinding and Cut-off wheels up to 10 inches diameter. 1/16 to 1¼" face, ⅛ to 3 in. holes. Ass't. grits—all brand new—Made by Norton, Carborundum, Macklin, Bay State, etc. Also included are 100 slotted disc cloths; 100 paper discs; 10 pencil rolls; 20 abrasive strips; 2 felt bobs; 2 felt wheels; 1 4" rag buff; 3 honing stones; 10 abrasive sleeves; 10 mounted stones, ⅛ and ¼" shank; 2 mandrels; 2 rotary files, ¼" shank; 50 abrasive discs; 2 72" abrasive belts; 5 9x11 abrasive sheets. Satisfaction Guaranteed.
350 Pieces—Ass't. sizes FOB Chicago—All for Only $6.95

GROBAN SUPPLY CO., Dept. PS-6,
1522 SO. MICHIGAN AVE. CHICAGO 5, ILL.

scientific. . . . A rather stupid suggestion. . . . I'm just out of high school, but I know better than that. Watch it.

SANFORD ROBERTS

Oklahoma City

Sir:

. . . Unless Galileo was wrong, the fountain pen with the weighted end would break as many points as an ordinary one.

FRANK WELLS

Montgomery, Ala.

Sir:

Shame on you! Galileo proved it wouldn't work. . . . Perhaps the point saver would work if a parachute were attached. . . .

T. G. DALBY

Minneapolis, Minn.

No stranger to the Tower of Pisa, PS is the victim of a classic scientific mistake—an erroneous conclusion drawn from inaccurate experimentation. Some time was spent in dropping a pen with several ounces of wire solder wrapped around its cap. Since the tally showed an apparent tendency to spare the point, the item was published.

Just Between Bombers

Sir:

. . . The airplane that is being dismantled on page 168 of the March PS ("New Pans from Old Planes") is not an A-26 but a B-26, an old and very noble bomber. I flew many missions in this plane as a tail gunner.

S/SGT. STEVE M. NATHAN

St. John, Newfoundland

Your sharp eye is absolutely right. PS apologetically stands corrected.

Over-Simplification

Sir:

It was with great interest that I read your article on the hot-air engine in the February issue. I am puzzled by the simplified diagram on page 148. Is this drawing correct, or should the crank be shown at the top of the shaft?

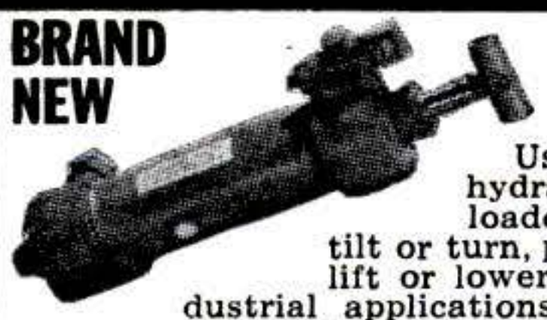
W. HOLBROOK

Los Angeles, Calif.

The crank should be at the top. Combining different parts of two drawings resulted in this mechanical discrepancy.

GROBAN'S SURPLUS BARGAINS!

BRAND NEW



AIR OR OIL HYDRAULICS

Use hydraulics on arbor presses, hydraulic presses, hay lifts, manure loaders, lift trucks—push or pull, tilt or turn, press or squeeze, open or close, lift or lower—and other hydraulic and industrial applications. Use with either air or oil . . . of finest precision workmanship.

1. Double action, 3" bore, 12" stroke. All steel hydraulic cylinder, will lift up to 12,000 lbs. (7000 lbs. in 3 seconds with Vickers Pump). $78.00 value. Wt. 12 lbs. . . . . **$19.50** post paid

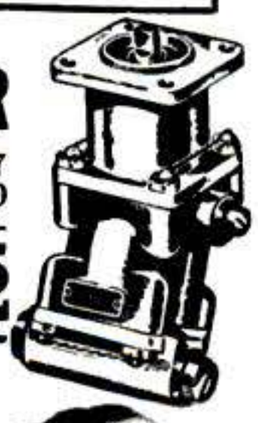
2. Double action, 1½" bore, 27" stroke. (Will lift 1760 lbs. in 2 seconds with Vickers Pump). Wt. 8 lbs. A $55.00 hydraulic cylinder value **for only** . . . . . **$12.95** post paid

3. Double action, 2⅜" bore, 8" stroke. (Will lift 4400 lbs. in one second with Vickers Pump). Will withstand 1500 P.S.I. against wall. A $65.00 value, available now at . . . . . **$14.50** paid post

BRAND NEW HYDRAULIC CONTROL VALVES

With built-in relief valve. Use them manually or automatically for single or double action cylinders. Inlet port 9/16". outlet port ¾", cylinder port ¾". Complete with ILLUSTRATED instruction sheet. 6"x3½"x3¼". Wt. 2 lbs. A $21.00 Value. Available now at **$5.95** post paid

VICKERS MF6 HYDRAULIC PUMP OR MOTOR



Compact, powerful, rated 1,000 P.S.I., .507 cu. in. per revolution, 8 gal. per min. at 3750 r.p.m. Change rotation by reversing flow. Delivers up to 6 H.P. BRAND NEW. Wt. 4½ lbs. $60.00 value for . . . . . **$14.95** Postpaid

½ H.P.—A.C. ELECTRIC MOTOR

(Capacitor Type) BRAND NEW

For the Farm—Home—Factory—Workshop

Here Are a Few of Many Uses:

- PUMPS
- STOKERS
- OIL BURNERS
- UNIT HEATERS
- AIR COMPRESSORS
- REFRIGERATION UNITS
- CONVEYORS
- BLOWERS—FANS
- MACHINE TOOLS

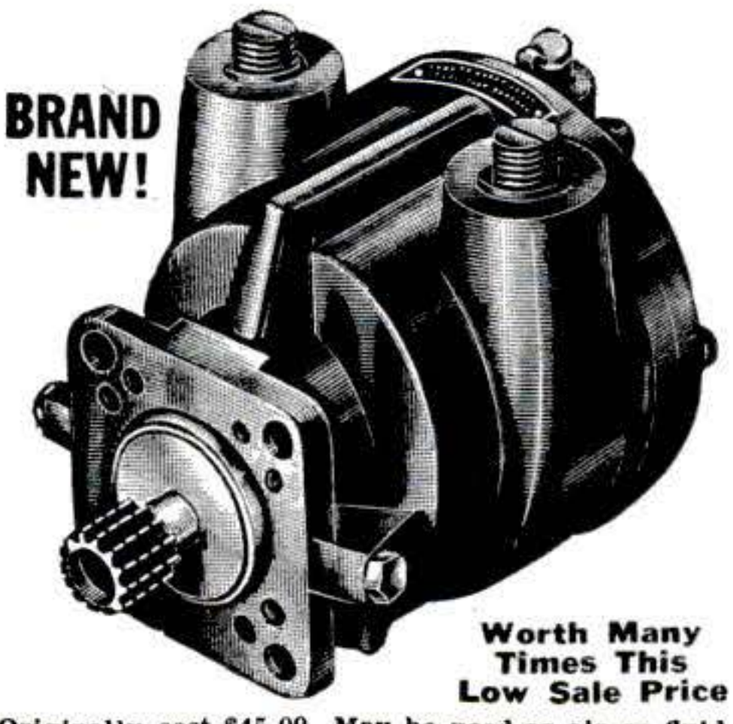
⅝" Keyed Shaft; 115-230 Volt; 60 cycle; 1725 R.P.M. Single phase—alternating current—capacitor start—induction Run—Resilient Mount and Motor Protector—Reversible Rotation—High Starting Torque — Magnetic Starting Switch. **Cooler Operation—Dynamic Balance—Compact Design** . . . . . **$34.95** F.O.B. Chicago

VACUUM-AIR HYDRAULIC GENERAL PURPOSE PUMP

Original Cost $45.00 Now Only $9.95 Prepaid in U. S. A.

Use them for OIL BURNERS — SPRAYING MACHINES — MILKING MACHINES — COMPRESSORS — VACUUM PUMPS — HYDRAULIC SYSTEMS — MANURE LOADERS — PRESSES, etc.

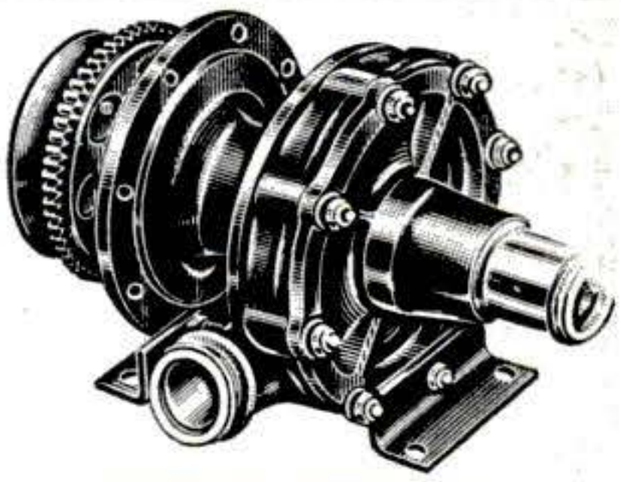
BRAND NEW!



Worth Many Times This Low Sale Price

● Originally cost $45.00. May be used as air or fluid pump—for pressure or vacuum. Standard ⅜ inch pipe thread with interchangeable ports. Will pump 7½ gal. SAE 30 oil per minute at 300 RPM. Builds air pressure of 30 lbs. per sq. in. at 1000 RPM. Vacuum will draw 26 inches of mercury at 1750 RPM. Develops up to 120 lbs. per sq. inch of hydraulic pressure, which in conjunction with a 3 inch hydraulic cylinder will lift 840 lbs. minimum. Runs forward or reverse. Self aligning shaft. Die cast aluminum housing 6x4x4 inches. Has stainless alloy steel vanes and impeller. Made by Bendix Avia. Corp. Spline terminal for direct drive—readily replaced with a pulley. Recommend a ¼ H.P. or stronger electric motor. Rated capacity 1500 RPM with high overload factor. Special price for quantity users. Complete illustrated engineering report and instruction booklet FREE with every pump. Send check or money order today! Postpaid in U.S.A. **$9.95**

BRAND NEW ALL-PURPOSE WATER PUMP



Ready for use on any pumping need. Use it for:

DRAINING BASEMENTS • HOME WATER SYSTEMS • FIRE PROTECTION • PRESSURE BOOSTER • IRRIGATION • DRAINING PONDS, TANKS, etc. • SPRINKLING SYSTEMS • STOCK WATERING • INDUSTRIAL PUMPING •

Complete with pulley and mounting brackets, ready for use.

BELT DRIVEN Centrifugal Pump

An extraordinary value for all types of intermittent or continuous pumping in the home . . . farm . . . factory. Built to exact specifications of Packard Motor Car Co. for use in Rolls-Royce Merlin Aircraft Engines. May be run with electric motor, gas engine or power take-off on tractor. Delivers up to 25 gallons a minute with ¼ H.P. motor; 80 gal. a min. with one H.P. motor. Will deliver up to 44 ft. head or 25 ft. suction. Use 1" outlet hose; 1" or 1½" inlet hose (recommended).

COMPLETE ENGINEERING REPORTS AND OPERATING INSTRUCTIONS FREE WITH PUMP

Has cast aluminum housing, accurately machined 5" bronze impeller; 3½" V belt pulley and mounting brackets. Shaft rotates on ball bearing; has grease gun fitting.

Original cost approx. $88.00. Shipping weight 10 lbs. A REAL BUY. Satisfaction guaranteed. Mail orders filled promptly. **$21.50** F.O.B. Chicago

Here is YOUR identification stencil set! Ideal for all industries in marking boxes and packages, identifying inventory, numbering doors, etc. GUARANTEED. Saves time, money and effort, easy to use, pays for itself. Metal letters, INTERLOCKING to make words. Comes in handy wooden box with sliding top.

CONTAINS
1 stencil brush; 1 can paint, stencil paste; 1 complete set of metal letters, figures, punctuation and spacers.

COMPLETE KIT with 1" letters..... **$2.50** Prepaid

COMPLETE KIT with 2" letters..... **$3.95** Prepaid

U.S. SURPLUS BARGAIN

POLAROID GOGGLE KIT

Use them for all outdoor sports, beach, motoring, boating—anything.

Brand New! In original packing. Each with four interchangeable lenses. Shock Proof Frame. Shatterproof Lenses.

Heavy windproof sponge rubber ventilated frame with snap button lens retainers! Adj. elastic head band. Clear, red, green, amber, flexible, shatterproof lens, all instantly interchangeable, with carrying case. They won't last long at this price—it's smart to buy an extra. **$1.00** Prepaid in U.S.A.

GROBAN SUPPLY CO. DEPT. PS-6, 1507 S. MICHIGAN AVE., CHICAGO 5, ILL.

Copyrighted material

Now You Can Lick Any AUTO REPAIR JOB!

in LESS Time—with LESS Work

Now you can "polish off" the hardest jobs the EASIEST way! Just look up make, model, job in MoToR's New AUTO REPAIR MANUAL and go to it! Covers *every* job on *every* car built from 1935 to 1948! Clear, illustrated step-by-step instructions "breeze you through" any job from carburetor to rear end—quickly, easily, RIGHT! Explained as simply as A-B-C!

Over 700 big 8½" x 11" pages; 200 charts; 200,000 service, repair, adjustment, replacement, tune-up facts. Over 1700 cut-away pictures and diagrams show exactly WHAT to do, HOW to do it. Used by U. S. Army and Navy, trade schools. 1948 Edition.

Examine It FREE

Examine book FREE. Unless CONVINCED it's the greatest time and money-saver you've ever owned, return it in 7 days, pay nothing. Otherwise send $1 (plus 35c postage); then $2 monthly for 2 months; 95c one month later.

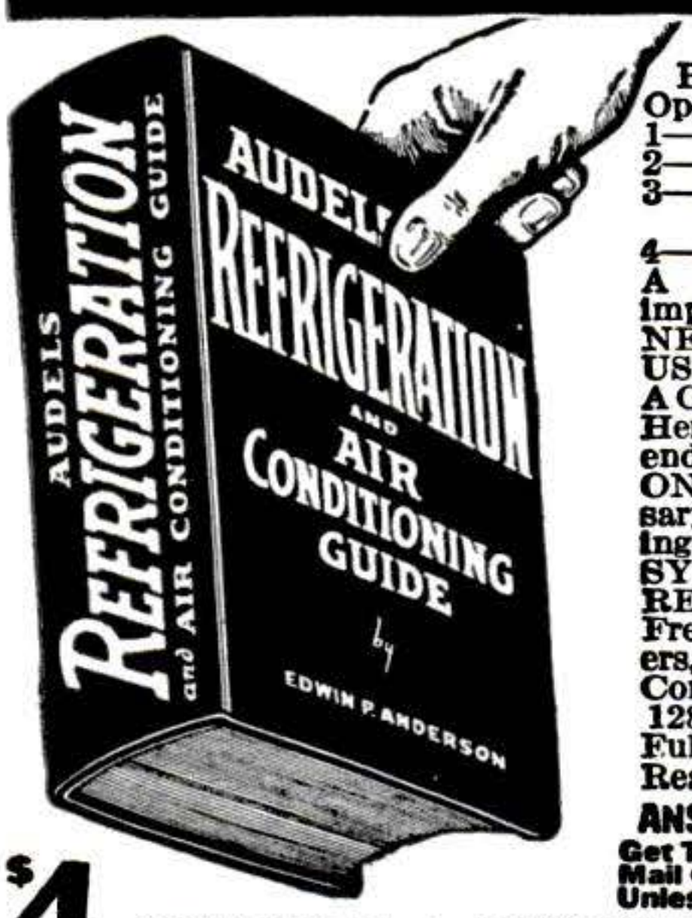
MoToR Book Dept., Desk 2G, 572 Madison Ave., New York 22, N. Y.

Covers EVERY Job On EVERY Car Built from 1935 to 1948!

All 32 makes—all 653 models, from American Bantam to Willys Jeep—including Kaiser and Frazer! Includes Valve Measurements; Torque Wrench Reading; Starting Motor; Engine Clearances; Generator; Body Service; Dash Gauges; Brake Specifications; Electric, Fuel, Cooling, Lubricating Systems; Transmissions; Universals; Front Ends; Wheels; Rear Ends, and much more!

NOW READY! NEW FROM COVER TO COVER

AUDELS REFRIGERATION and AIR CONDITIONING GUIDE



4 Books in One! Covering:
Basic principles, Servicing, Operation, Repair of
1—Household Refrigeration
2—Special Refrigeration Units
3—Commercial & Industrial Refrigeration
4—Air Conditioning Systems

A gold mine of essential important facts for ENGINEERS, SERVICEMEN & USERS.

A Good Book is a Good Friend! Here you have at your fingers' ends a Complete Library in ONE VOLUME, the necessary data you have been looking for on: MODERN UNITS, SYSTEMS & MACHINES, REFRIGERANTS, including Freon, Lockers, Water Coolers, Quick Freezing & Air Conditioning Systems.

1280 Pages, 46 chapters all Fully Illustrated & indexed for Ready Reference.

ANSWERS YOUR QUESTIONS

Get This Information for Yourself. Mail Coupon Today. No Obligation Unless Satisfied. ASK TO SEE IT.

$4 COMPLETE • PAY ONLY $1. A MONTH ←

AUDEL, Publishers, 49 W. 23rd St., New York 10, N.Y.

MAIL AUDELS NEW REFRIGERATION GUIDE for free examination. If O. K. I will send you $1 in 7 days; then remit $1 monthly until price of $4 is paid. Otherwise I will return it.

Name _____

Address _____

Occupation _____

Employed by _____ P.S.M.

Free.. TO YOU WHO WANT SUCCESS IN AVIATION

BEAUTIFUL 28-PAGE BOOKLET -- WRITE DEPT. 71A

Embry Riddle
International
SCHOOL OF AVIATION
MIAMI 30, FLORIDA

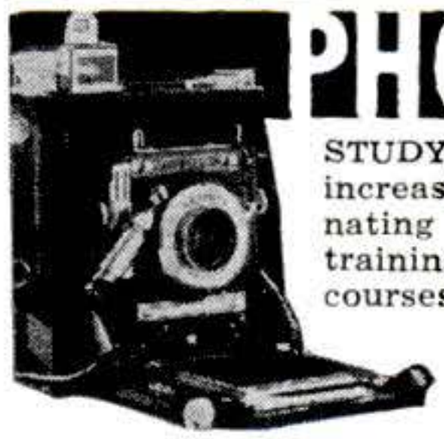
ENGINEERING DEGREE IN 27 MONTHS

INDIANA TECHNICAL COLLEGE

Aeronautical, Chemical, Civil, Electrical, Mechanical, and Radio Engineering (inc. television). Drafting, 1-yr. Gov't approved for G.I.'s. Low rate. Earn board. Large industrial center. Students from 48 states, 18 countries. Demand for graduates. Enter June, Sept., Dec., March. Catalog.

668 E. Washington Blvd., Ft. Wayne 2, Ind.

PHOTOGRAPHY



STUDY AT HOME. Photography offers ever-increasing opportunities for well-paid, fascinating careers. Success-proved N. Y. I. training qualifies you at home. Also resident courses. 38th year. Details FREE!

NEW YORK INSTITUTE OF PHOTOGRAPHY
Dept. 5, 10 West 33 St., New York 1, N. Y.

LEARN MONEY-MAKING CARTOONING

IN SPARE TIME — by Easy Picture Chart Method

Same Simplified Method that has helped train creators of "Terry & Pirates," "Freckles," "Out Our Way," "Winnie Winkle," "Reg'lar Fellers," "Strange As It Seems," "The Neighbors," and many others. Earn while learning. Send 10c for Picture Chart (to test your ability). Samples of successful students, and full details. (State age.)

The Landon School, 4826 Cleveland Transit Bldg., Cleveland, O.

CORRESPONDENCE COURSES IN RADIO and ELECTRICAL ENGINEERING

Tuition $25

ELECTRICAL ENGINEERING. Get good grasp of wide electrical field. Modern. Very understandable. Theory made easy.
RADIO ENGINEERING. Extra fine course in radio, public address, photo-electric work. Trains you to be super-service man, real vacuum tube technician. Tuition ONLY $25. either course. Deferred payment plan. Servicemen needed badly.

FREE Write for free copies of school catalogs, student magazines, etc.
LINCOLN ENGINEERING SCHOOL, Box 931-S-114 LINCOLN, NEBR.

MINERALS

The most complete handbook on the subject ever published; with every step in identification and analysis clearly explained and illustrated in full color.

IDENTIFICATION AND QUALITATIVE CHEMICAL ANALYSIS OF MINERALS—By Orsino C. Smith, A. B., A. M.

At last, all the facts about all minerals between the covers of one great book! More than 2,000 minerals listed and classified by specific gravity and hardness. Hundreds of beautiful, full-color photographs and illustrations. Complete directions for determining any known mineral from its physical properties—index of refraction, color, streak, lustre, cleavage, fracture, fusibility, etc.—all organized for instant practical use. **$6.50**

D. VAN NOSTRAND COMPANY, INC.
250 Fourth Avenue, New York 3, N. Y.
EXAMINE THIS GREAT BOOK FREE

Please send me a copy of "Identification and Qualitative Chemical Analysis of Minerals". Within 10 days, I will either return the book or send you $6.50 plus a few cents postage.

Name .....
Address .....
City ..... Zone .... State .....
Pop. Sci.-June, 1948

Copyrighted material

Profit Through Training in RADIO-ELECTRONICS

Prepare at HOME or in our CHICAGO LABORATORY to get REAL MONEY, a BETTER JOB, or a BUSINESS OF YOUR OWN . . . .

Our business is helping men . . . and young men . . . get into a well-paying future in the highly profitable fields of RADIO-ELECTRONICS. During the past sixteen years we have trained many men who desired better jobs or businesses of their own. We can effectively provide you with this same opportunity either in our new, modern Chicago laboratories or in the privacy of your own home.

TAKE YOUR CHOICE

If you choose to come to Chicago, we shall find comfortable living quarters for you. If you train at home, we shall send you modern, practical equipment. In either of these two methods, you will have the supervision of some of the finest instructors in the country. Fill in coupon below and we shall send you, absolutely FREE, full information about our program of building men for better opportunities in RADIO-ELECTRONICS. DeForest's Training, Inc. also includes instruction in FM Radio, Television and Industrial Electronics.

If you prefer to remain at home, you receive eight (8) big kits of radio parts and assemblies from which you can work out dozens of fascinating radio circuits to gain practical experience in your own home. In addition, you receive a 16 mm. motion picture projector and 12 information-packed reels of film which help you learn faster . . . easier. You also get modern looseleaf lessons with handy fold-out diagrams.

EMPLOYMENT SERVICE

When you complete your training our effective Employment Service helps you get started toward a real future. Mail coupon below today . . . do not delay.

VETERANS

Both our (1) Chicago Laboratory and (2) Home Study training are accepted under the "G. I. Law." If you qualify, the Government will pay cost of either training you select.

MAIL THIS OPPORTUNITY COUPON *NOW!*

Mr. E. B. De Vry, President
DeForest's Training, Inc.
2533 N. Ashland Ave., Dept. PS-E6
Chicago 14, Illinois

Please show me how I may get started toward a good job or a business of my own in Radio-Electronics.

Name.....Age.....

Address.....Apt.....

City.....Zone.....State.....

☐ If under 16, check here for special information.

☐ If a discharged Veteran of World War II check here.

DeForest's Training, Inc. CHICAGO, ILLINOIS

Associated with the DeVRY Corporation
Builders of Movie & Electronic Equipment

Copyrighted material

EARN MORE

$ $ $ $ $

SEND FOR THIS *FREE* BOOK NOW!

● Increase your earning power. Become *thoroughly* trained in a well-paid profession. Without obligation, find out about the opportunities in Electrical, Mechanical, Plastics, Civil, Mining and other engineering fields. Our *free* 118-page handbook, lists details of home study courses, compiled by world authorities. See for yourself how you can soon earn more dollars. Write today, to: Canadian Institute of Science and Technology, Ltd., 457 Century Building, 412, 5th Street, N.W., Washington, D.C.

Details of over 60 home study courses based on standard textbooks

MAIL THIS COUPON NOW

Canadian Institute of Science & Technology, Ltd., 457 Century Building, 412, 5th Street N.W., Washington, D.C.

Please forward free of cost or obligation of any kind your 118-page handbook "Engineering Opportunities".

Name..... Age.....

Address .....

CANADIAN ENQUIRIES: 219 Bay Street, Toronto 1.

MADE $14 PER DAY

While Still Learning

"By the time I finished half your course, I was making $14.00 per day. I have made enough on the side to more than pay for the course—" **T.E.H.—West Virginia**

LEARN ELECTRIC APPLIANCE

We Teach
How to Repair
Washing Machines
Vacuum Cleaners
Electric Ranges
Lamps, Motors, Irons, etc.
REFRIGERATION and House Wiring
At Home In Your Spare Time!

REPAIR & SERVICE

For a man handy with tools, and happiest when working with his hands, OPPORTUNITY is Wide Open Today in this great and growing field. Everyone is a customer for the man trained to service electric appliances.

OPEN YOUR OWN SHOP

Our practical HOME COURSE teaches you this business from A to Z—preparing you to take a well paid job or open your own shop. You can actually start in your basement or garage with the tools I send you . . . before finishing.

I Include A BIG KIT of special appliance tools at NO EXTRA COST

MAIL THIS COUPON for FREE BOOK

PACIFIC TRAINING SCHOOL
7217 So. Broadway, Dept. S-86, Los Angeles 3, Calif.

Dear Sirs: Please send me, without obligation, your free booklet and complete details.

Name.....

Address.....

City.....*State*.....

Be A MASTER PLUMBER

Earn $15 To $50 A Day

DON'T ENVY THE PLUMBER—BE ONE

Every skilled workman will tell you that Plumbers have the best of it. WINTER and SUMMER the Plumber is busy at top wages. No skilled Plumber is ever out of a job—compare his opportunities with any trade, plus the opportunities of having your own shop.
We teach you Plumbing with TOOLS (not books) under Licensed Master PLUMBERS in one of the finest equipped schools in America. We make you a Plumber, every branch is taught thoroughly—Lead Work—Blueprint for plan reading—all other tricks.

LEARN IN 32 WEEKS WITHOUT PREVIOUS EXPERIENCE

If you like to work with tools you owe it to yourself to investigate. No need to ever work as an apprentice. Get free bulletin. Write now! G.I. APPROVED. Our 24th year.

UNIVERSAL PLUMBING SCHOOL
819 HOLMES STREET KANSAS CITY, MO.

LAW FREE BOOK

Write today for FREE 48-page book, **"THE LAW-TRAINED MAN,"** which shows how to learn law easily in spare time at home through the Blackstone course prepared by 60 well-known law authorities. We furnish all material including 18-volume Modern American Law library. Many successful attorneys among our graduates. LL.B. degree. Moderate cost; easy terms; Money-Back Agreement.

BLACKSTONE COLLEGE OF LAW
225 N. Michigan Ave., Dept. 120-A, Chicago 1, Ill.
A Correspondence Institution Founded in 1890

LEARN LEATHER CARVING

Home study course prepares you for this interesting and profitable hobby. Many students earning as much as $3.00 an hour in spare time carving billfolds, belts, handbags, saddles, etc. Complete with instructions, designs and individual analysis of your work. Send for valuable catalog containing many helpful and profitable suggestions

BAIRD'S SCHOOL OF LEATHER CARVING, 1212 South Bonnie Brae, Los Angeles 6, Calif. Dept.B-2

GET INTO CARTOONING!

Let **Hartman** teach you cartooning, gag writing at home. Learn by mail from a professional! Send Name, Address for **FREE DETAILS.**
Hartman Studios, 2776 California Court, Lincoln 8, Nebr.

BEARINGS

Fafnir, S.K.F., N.D. & Torrington

Bore	O.D.	Type	Price
1/4"	3/4"	Ball	.22
5/32"	5/8"	Ball	.15
3/16"	1/2"	Needle	.15
1/4"	5/8"	Needle	.15
1"	1 1/4"	Needle	.28
1 3/4"	3"	Ball	.90

Minimum order 10 bearings. Add 10c for postage.

JAY-CEE SALES CO.
4554 Grand River Ave. Detroit 8, Mich.

STAMMER?

This new 128-page book, "Stammering, Its Cause and Correction," describes the Bogue Unit Method for scientific correction of stammering and stuttering—successful for 47 years. **Benj. N. Bogue, Dept. 4826, Circle Tower, Indianapolis 4, Ind.**

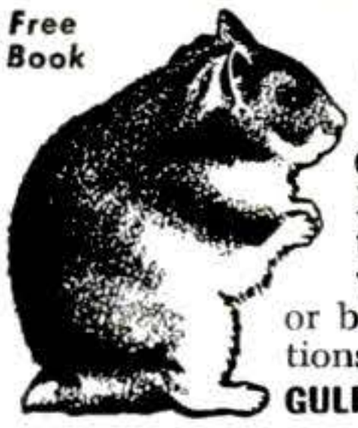
GET THIS FREE BOOK!

LEARN MEAT CUTTING At Home—In Spare Time

Get into the vital meat industry. Concise, practical Home Training based on 25 years proven instruction methods used at National's famous resident school. Prepares you for bigger pay as Meat Cutter, supervision, market manager or more money in your own store. Go as rapidly as your spare time permits. Diploma. Start NOW to turn your spare hours into money. Send for FREE bulletin today. No obligation.

National School of Meat Cutting Inc., Div. O-67, Toledo 4, Ohio

Free Book



RAISE HAMSTERS

The new wonder animals from Syria. Often called Toy Bears. Delightful pets. Everyone wants them. Laboratories need thousands. Clean, odorless. Raise anywhere. A profitable and interesting hobby or business. We furnish breeders and instructions. Write today for free book.

GULF HAMSTERY, 1540 BASIL ST., MOBILE, ALA.

Copyrighted material

You receive all parts, including tubes, for building this fine, modern Superheterodyne Receiver. This and other valuable standard equipment becomes your property.

Learn RADIO

TELEVISION, ELECTRONICS *by* SHOP METHOD HOME TRAINING

Let NATIONAL SCHOOLS, of Los Angeles, a practical Technical Resident Trade School for almost 50 years, train you for today's unlimited opportunities in Radio

these two **FREE** *books will tell you how*

GOOD JOBS AWAIT THE TRAINED RADIO TECHNICIAN

You are needed in the great, modern Radio, Television and Electronics industry! Trained Radio technicians are in constant and growing demand at excellent pay—in Broadcasting, Communications, Television, Radar, Research Laboratories, Home Radio Service, etc. National Schools Master Shop Method Home Study Course, with newly added lessons and equipment, can train you in your spare time, **right in your own home,** for these exciting opportunities. Our method has been proved by the remarkable success of National Schools-trained men all over the world.

You Learn by Building Equipment with Standard Radio Parts We Send You

Your National Schools Course includes not only basic theory, but **practical** training as well—**you learn by doing.** We send you complete standard equipment of professional quality for building various experimental and test units. You advance step by step until you are able to build the modern superheterodyne receiver shown above, which is yours to keep and enjoy. You perform more than 100 experiments—build many types of circuits, signal generator, low power radio transmitter, audio oscillator, and other units. The Free Books shown above tell you more about it—send for them today!

Lessons and Instruction Material Are Up-to-date, Practical, Interesting

National Schools Master Shop Method Home Training gives you basic and advanced instruction in all phases of Radio, Television and Electronics. Each lesson is made easy to understand by numerous illustrations and diagrams. All instruction material has been developed and tested in our own shops and laboratories, under the supervision of our own engineers and instructors. A free sample lesson is yours upon request—use the coupon below.

Here's Just a Few of the Interesting Facts you Learn with the

FREE MANUAL

1. Routine for diagnosing Radio Troubles.
2. Preliminary inspection of Receivers.
3. How to Test and Measure Voltages.
4. How to Test Speaker in Audio Stages.
5. How to Trace the Circuit and Prepare Skeleton Diagram.
6. Complete Reference Table for Quickly Locating Receiver Troubles.

Both Resident and Home Study Courses Offered

APPROVED FOR VETERANS

Check Coupon

NOW! NEW PROFESSIONAL MULTITESTER INCLUDED

This versatile testing instrument is portable and complete with test leads and batteries. Simple to operate, accurate and dependable. You will be able to quickly locate trouble and adjust the most delicate circuits. You can use the Multitester at home or on service calls. It is designed to measure AC and DC volts, current, resistance and decibels. You will be proud to own and use this valuable professional instrument.

NATIONAL SCHOOLS
LOS ANGELES 37, CALIFORNIA EST. 1905

MAIL OPPORTUNITY COUPON FOR QUICK ACTION

National Schools, Dept. PS-6
4000 South Figueroa Street
Los Angeles 37, California

(Mail in envelope or paste on penny postcard.)

Mail me FREE the books mentioned in your ad including a sample lesson of your course. I understand no salesman will call on me.

NAME.....AGE.....

ADDRESS.....

CITY.....ZONE.....STATE.....

☐ Check here if veteran of World War II
Approved for veterans

GET THE DETAILS—SEND THE COUPON ➡

Copyrighted material

NOW! Build Your Future On DIESEL Opportunities

LOOK around you. See the way tractors, trucks, buses, railroads, ships, power plants and equipment of many kinds are "going Diesel." Every day new opportunities are opening—in industrial and farming communities—for trained men who can install, maintain, operate and repair Diesel engines. Plan now to build your future in this growing field.

Diesel Knowledge is Earning Power

You don't have to give up your present job. Now, you can begin learning DIESEL in spare time at home. UEI practical training teaches you, step by step, how Diesel engines operate, how fuel systems work, repairs, accessories and auxiliary equipment; a world of Diesel "know how." Includes actual practice on Diesel equipment in our shop under expert guidance. UEI training methods are successful. For 20 years they have helped mechanically inclined men better themselves.

Send Coupon for FREE FACTS

NOW IT'S UP TO YOU!

Coupon below brings you all the facts without cost or obligation. Get going today! MAIL COUPON NOW.

UTILITIES ENGINEERING INSTITUTE
Diesel Division
Founded 1927
2521 Sheffield, Dept. 368-D
Chicago 14, Ill.

UTILITIES ENGINEERING INSTITUTE, Diesel Division
2521 Sheffield, Dept. 368-D, Chicago 14, Ill.
Please send me Free Facts about Diesel opportunities and training.

NAME_____ Age_____

ADDRESS_____

CITY_____ Zone or County_____ STATE_____

☐ Check here for special information if you are under 17.

START AS HIGH AS $3021 YEAR

Many Early Examinations Expected. Prepare NOW!

Veterans Get Special Preference! 40-Page Civil Service Book FREE. Although not Government controlled, this can help you get a Government job. Mail Coupon Today SURE.

★

COUPON

FRANKLIN INSTITUTE
Dept. C81
Rochester 4, N. Y.

Gentlemen: Rush to me, FREE of charge, list of U. S. government big pay jobs. Send FREE 40-page book describing salaries, vacations, hours, work, etc. Tell me how to qualify for one of these jobs.

Name.....

Address.....Vet?.....

PRACTICAL TECHNICAL TRAINING FOR YOU

SPECIALIZE in 6 months to 3 years

COURSES

SERVICE
6 to 12 Months
- Electricity
- Welding
- Refrigeration
- Heating

TECHNICIAN
1 to 2 Years
- Electricity
- Radio
- Electronics
- Refrigeration, Heating and Air Conditioning

PROFESSIONAL
3 Years
- Electrical Engineering Bachelor of Science Degree Major in Machinery or Electronics

Train for a substantial career in industry—or a business of your own. Each 6-month course is complete in itself, yet prepares you for advanced courses. More than 35,000 former students in industries the world over. 1,538 students now enrolled from 48 states and 13 overseas countries. Faculty of 72 specialists.

Write for booklet "Career Building" and mention course interested in.

MILWAUKEE SCHOOL of ENGINEERING
A Technical Institute Founded 1903
Dept. PS-648R, 1020 N. Broadway, Milwaukee, Wisconsin

Learn LANDSCAPE GARDENING

A thorough, interesting, home study course for those who wish to become Landscapers, Gardeners, Designers, etc., for profit or pleasure. Write today for **Free Book** to

APPROVED FOR VETERANS **NATIONAL LANDSCAPE INSTITUTE**
Dept. PS 6, 310 So. Robertson, Los Angeles 36

The American Institute of Specialized Watch Repair
270-276 East Building GRAND RAPIDS 6, MICHIGAN
A Fully Accredited School

Write for Free Circular

You can learn this highly fascinating and profitable trade through this Institute, either at home by correspondence . . or at the resident school.
Earn While You Learn

Learn WATCH REPAIRING

LEARN TO WRITE *a Good Hand!*

FOR BUSINESS AND SOCIAL SUCCESS!

Improve your handwriting at home quickly with my new instruction books just off the press. Master all the secrets of better penmanship. Simple and easy, fully illustrated, highly endorsed. Begin today. Write for: ☐ **New Free Book,** "How to Become a Good Penman", or check books wanted, $1.00 each. ☐ Business Writing ☐ Artistic Writing ☐ Card Writing ☐ Engrossing Alphabets ☐ Bird and Design Flourishing ☐ Complete Set $4.50 ☐ Enclose 10c for your name beautifully written and shading penpoint.

S. A. Ziller, President, TAMBLYN SCHOOL OF PENMANSHIP
439 Ridge Bldg. *In Business Over 52 Years* **Kansas City, Mo., U.S.A.**

ANALYZE *Handwriting*

Uncrowded, fascinating field. Gratifying earnings reported by graduates in Employment, Credit, Social Service, Police and Entertainment fields. Others have developed profitable private practice, full or spare time, as Personal Problem and Vocational Counselors. Send for 3000 word TEST LESSON and Grapho Analyst FREE.

A. I. G. A. Inc., Wilhoit Bldg., Dept. 126, Springfield, Mo.

FREE BOOK and LESSON

Learn Profitable Profession in 90 days at Home

MEN AND WOMEN, 18 TO 50—Many Swedish Massage graduates make $50, $75 or even more per week. Large full time incomes from doctors, hospitals, sanatoriums, clubs or private practice. Others make good money in spare time. You can win independence and prepare for future security by training at home and qualifying for Diploma. Anatomy Charts and 32-page Illustrated Book FREE—Now! **The College of Swedish Massage, Dept. 870G, 100 E. Ohio St., Chicago 11, Ill.**

Copyrighted material

ACE *Hollywood Experts* WILL TRAIN YOU AT HOME *to MAKE GOOD in*

RADIO TELEVISION-ELECTRONICS

through practical EXPERIMENTS with

10 BIG KITS of RADIO PARTS R.T.A. GIVES YOU!

YOU WILL DO SCORES OF PRACTICAL JOBS AND EXPERIMENTS

The 10 BIG KITS RTA GIVES YOU enable you to do many practical jobs. Illustrated above are only a few of the many job-exercises you do. You build a TRF Receiver, a High-Frequency Converter, a complete, powerful 6 Tube AC-DC Superheterodyne receiver, and perform more than a hundred other fascinating and valuable experiments. These jobs you do give you ACTUAL SHOP EXPERIENCE so vitally necessary to future success. Thus RTA methods assure you BALANCED TRAINING—Theory PLUS Real Experience.

Tear out coupon and mail today

MASTER HOLLYWOOD TECHNICIANS *Guide You*

It was no accident that RTA — RADIO TRAINING ASSOCIATION OF AMERICA — chose HOLLYWOOD as their headquarters. Hollywood has long been recognized as the very heart of America's Broadcasting, Television, Radio and Sound industries. Thus, RTA is right "on-the-spot" where new technical improvements are introduced, and is in the best possible position to bring students ACTUAL METHODS and TECHNIQUES developed BY the RADIO-TELEVISION industry, leading to real money-making opportunities!

OPPORTUNITIES *NOW* WIDE OPEN for Properly Trained Men

Latest reports estimate 400 MILLION new radio and television sets will be built in the next ten years . . . and more than 72 million dollars is being spent RIGHT NOW just for radio repairs ALONE! When you are thoroughly trained by RTA's Hollywood Experts—who have their fingers on the pulse of the Radio-Television industry—you can imagine what undreamed of opportunities await you in Your Own Radio Sales & Service Business, Television, Aviation, FM, Manufacturing and Communications, etc.

EARN *EXTRA MONEY while learning* AT HOME

Under RTA's amazingly easy, practical home-training plan there is no need for you to quit your present job. You study in SPARE TIME ONLY and RTA's Hollywood Experts show you how to earn WELCOME EXTRA CASH, even BEFORE FINISHING YOUR TRAINING! In fact, when friends and neighbors know you are studying Radio-Television you may—like many RTA students—actually get MORE REPAIR WORK THAN YOU CAN HANDLE.

25 Year Success Record

Backed by more than 25 years of experience in the home training field, RTA's practical "learn by doing" methods assure you quick, step-by-step progress. So begin preparing for your future in Radio-Television NOW, while the time is ripe. If you are at all mechanically inclined, and have a grammar school education, RTA can teach you how to MAKE GOOD as a Radio-Television technician.

R. T. A. GRADUATES SAY:

Thanks to R.T.A. I started my own radio store . . am making 220 percent more than when I enrolled.—W. E. Thon, Chicago.

Truly thankful for the day I enrolled for R.T.A. Course . . . it fitted me splendidly for my present position.—N. R. Hoffman, Radio Station WCOD, Harrisburg.

. . . R.T.A. sure opened my eyes to big money . . . thanks for all you have done for me.—Ernest Lancott, Cleveland.

GET FACTS! SEND FOR FREE BOOK!

telling all about RTA's streamlined home-training plan, developed by technicians in the heart of the booming Radio-Television field. Fill out the coupon TODAY and your FREE BOOK, entitled "How To Make Good In Radio-Television" will go out to you AT ONCE! No Obligation. RTA APPROVED FOR VETERANS.

RADIO TRAINING ASSOC. OF AMERICA, DEPT. PSF
5620 Hollywood Blvd., Hollywood 28, Calif.

Send FREE BOOK showing how to make good in Radio and Television, through training by Hollywood experts.

NAME _____ AGE _____

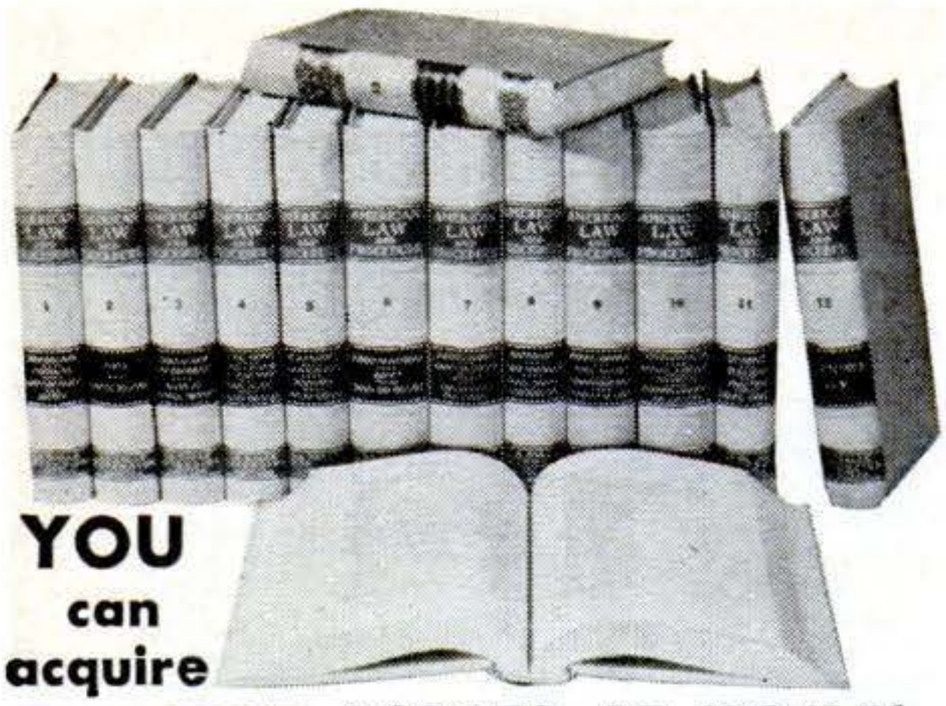
ADDRESS _____

CITY _____

ZONE _____ STATE _____

Check box if VETERAN of World War II ☐

Copyrighted material



YOU can acquire

LAW *NIGHTS AT HOME!* L.L.B. DEGREE

LaSalle's famous Law Library—used as reference in many Law libraries and Law offices—has enabled thousands to master Law surprisingly fast, in spare hours at home, for business and professional advancement.

These 14 remarkable volumes, compiled by leading professors and lawyers, cover the whole basic field of Law in condensed, orderly, simplified manner.

You advance rapidly with this great library, plus special lectures furnished. We guide you step-by-step with personalized Problem Method of instruction . . . you *learn by doing*—handling legal problems—not by memorizing rules.

Send for two FREE 48-page booklets, "Law Training for Leadership," and "Evidence," answering questions about Law and its value to you, and telling how LaSalle Law graduates are winning rapid advancement in business and public life. Mail coupon below. No obligation.

LA SALLE EXTENSION UNIVERSITY
A Correspondence Institution
417 S. Dearborn St. Dept. 683-L Chicago 5, ILL.

Send me your two FREE booklets described above, without obligation.

*Name*_____ *Age*_____

*Street*_____

*City, Zone & State*_____

LEARN ACCOUNTING SALESMANSHIP SECRETARIAL WORK

Assure Your Future Now!

Hill's, one of America's outstanding Business Schools, offers you the opportunity to enter one of the three fields acknowledged to hold substantial earnings and a secure future. Our FREE book, "Through Hill's to Success," tells how and where the best positions are found and how you can qualify for them by study at home or in our resident school. We have thousands of successful graduates and maintain nationwide employment service.

FREE WRITE TODAY

USE THIS HANDY COUPON

HILL'S EXTENSION SCHOOL Dept. PS-6
AND BUSINESS UNIVERSITY,
619 W. Main St., Oklahoma City 2, Okla.
Please send me your Free book, "Through Hill's to Success."

NAME_____

ADDRESS_____

CITY_____ STATE_____

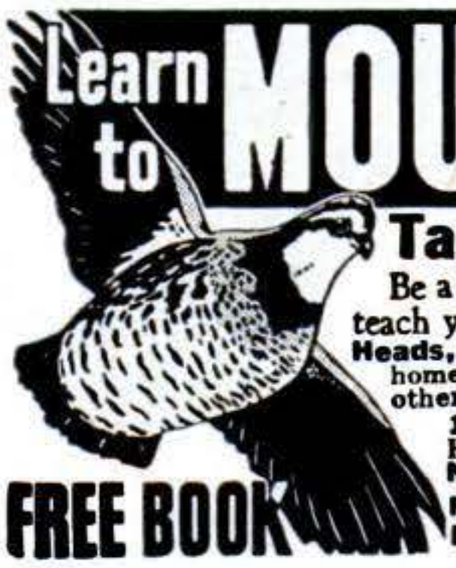
☐ Check here if eligible under G.I. Bill.

Be an INVESTIGATOR

JAMES S. BOLAN, FORMER POLICE COMMISSIONER OF NEW YORK CITY offers MEN & WOMEN an attractive opportunity to prepare for a future in *Investigation & Criminology* by comprehensive Home Study Course. Free placement service assists graduates to obtain jobs. APPROVED UNDER G. I. BILL OF RIGHTS. Write for Free Booklet PS.

THE BOLAN ACADEMY, INC.
EMPIRE STATE BLDG., NEW YORK 1, N. Y.

Learn to MOUNT BIRDS



Tan SKINS, make up FURS

Be a Taxidermist. *Double your hunting fun.* We teach you **at Home.** Mount **Birds, Animals, Fish, Heads,** common specimens. **Fun and profits.** Decorate home and den **MAKE MONEY.** Mount game, tan for others. Big profits in spare time. **WRITE TODAY.**

100 game pictures in FREE BOOK Hunters, get your copy. It's **Now Free.** Send post card. State your **AGE.**

FREE BOOK

NORTHWESTERN SCHOOL OF TAXIDERMY
Dept. 359-A Omaha, Nebraska

BE A REAL ESTATE BROKER *PAYS BIG!*

EASY TO LEARN—Start and run your own business *quickly.* Many graduates report making up to $1000 a month. Course of study covers *Sales, Property Management, Appraising, Loans, Mortgages* and hundreds of related subjects. Course offered in home study or residential classrooms.

FREE Big new illustrated catalog from this nationally known school. Send Post Card Today. G. I. Approved.

WEAVER SCHOOL OF REAL ESTATE
Dept. PS. 15 E. Pershing Road Kansas City, Mo.

LEARN WATCH *and* CLOCK REPAIRING

Start training now for a better paying job or your own profitable business. Qualified Watch Makers are in demand . . . Unlimited opportunities. Intensive practical training by experienced watch makers. Approved for veterans. Write for full details. Indicate if Veteran.

SCIENTIFIC SCHOOL OF WATCH MAKING, Dept. PS-6
3923 San Fernando Road Glendale 4, Calif.

Thrilling Work COLORING PHOTOS

Fascinating vocation learned at home by those with aptitude. Thrilling pastime. National method brings out life-like colors. Free booklet.

NATIONAL PHOTO COLORING SCHOOL
1315 S. Michigan, Dept. 136A, Chicago 5

Learn BAKING *At Home*

Baking is one of America's high industries in wages. Nearly depression-proof. Thorough basic home course lays sound foundation. If you have aptitude, write for FREE BOOKLET, "Opportunities in Commercial Baking."

National Baking School, 1315 Mich. Ave., Dept. 136A, Chicago 5

Learn How to HYPNOTIZE!

***Develop your personal* POWER!**

NOW . . . revealed for you . . . are the secrets of **practical hypnotism** . . . that strange, compelling force by which an expert operator can bring others under his power. He can **sway** people at will—issue commands and be obeyed—virtually cast a **spell** over his subjects. This sensational knowledge may make YOU a more dominant, masterful personality.

Illustrated* SELF-INSTRUCTION COURSE *in Useful Hypnotism

Amazing lessons in simple, easy-to-understand language. How to select a subject—how to hypnotize by telephone—**how to make money** from hypnotism—mental telepathy—stage hypnotism—self-hypnosis—how to use **modern** hypnotism to conquer inferiority complex, timidity, etc. Clear helpful pictures show operating positions, movements. **Startling low price.** Satisfaction guaranteed or money back.

COMPLETE ONLY $1.95

SEND NO MONEY! Simply pay postman $1.95 plus C.O.D. postage—or send $1.95 and we pay postage; same money-back guarantee. Order "Hypnotism Course" today! Nelson-Hall Co., 1139 S. Wabash Ave., Dept. 2F01, Chicago 5, Ill.

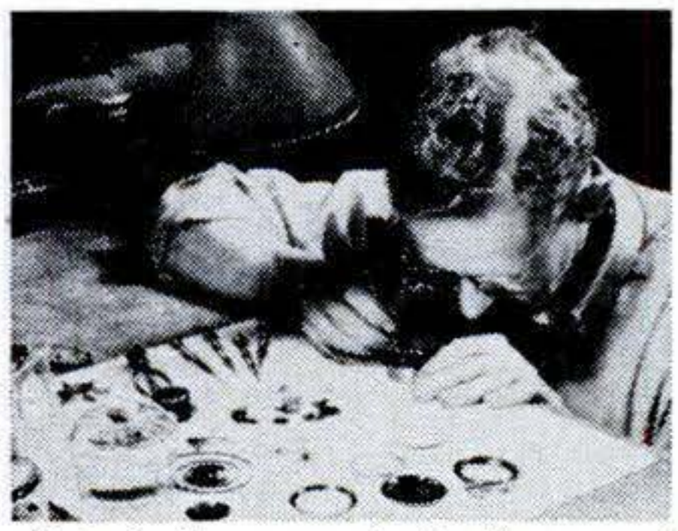
Copyrighted material

4 Career Ways to Success

CHOOSE THE ONE THAT FITS YOU BEST

APPROVED FOR TRAINING THE YOUNG MEN OF AMERICA — VETERAN AND NON-VETERAN

WATCHREPAIRING — A CAREER FIELD!



WORK — and plenty of it — Millions of watches and clocks need fixing. An interesting and needed service in the top-pay bracket, or start an independent business of your own. ALL TRAINING TOOLS provided. Special list of tools becomes student's property upon graduation. A training system unsurpassed anywhere. Free information. Send coupon in envelope or paste on penny postcard.

AMERICAN SCHOOL OF WATCHMAKING,
Dept. PS-68-4, 5145 W. San Fernando Rd., Los Angeles 26, Calif.
Gentlemen: Please send me free booklet and information on your training.

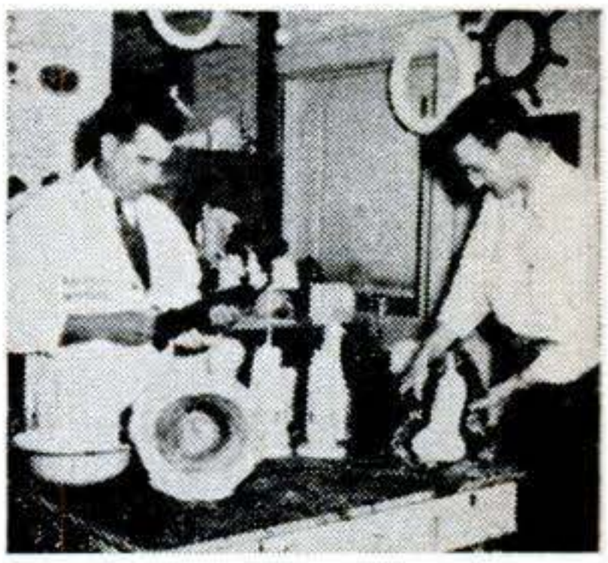
Name (PRINT)_____

Street_____ Age_____

City_____ State_____

Veteran_____ Non-Veteran_____

PLASTICS — MAGIC WORD!



Here at Plastics Institute in Los Angeles, men are learning the secrets of this glamorous industry for which the future seems unlimited. Hundreds of new products are being made of plastics requiring trained men to develop and fabricate them. Plastics Institute is the pioneer and leader in the field of plastics instruction. Its faculty and directors are leaders in the industry. Write for beautiful four-color catalog today. No obligation. Courses available either residential or *study at home*. Mail coupon in envelope or paste on penny postcard.

PLASTICS INDUSTRIES TECHNICAL INSTITUTE,
Dept. PS-68-4, 1601 S. Western Ave., Los Angeles 6, Calif.
Gentlemen: Please send me free booklet "World of Plastics" and information on your training.

Name (PRINT)_____

Street_____ Age_____

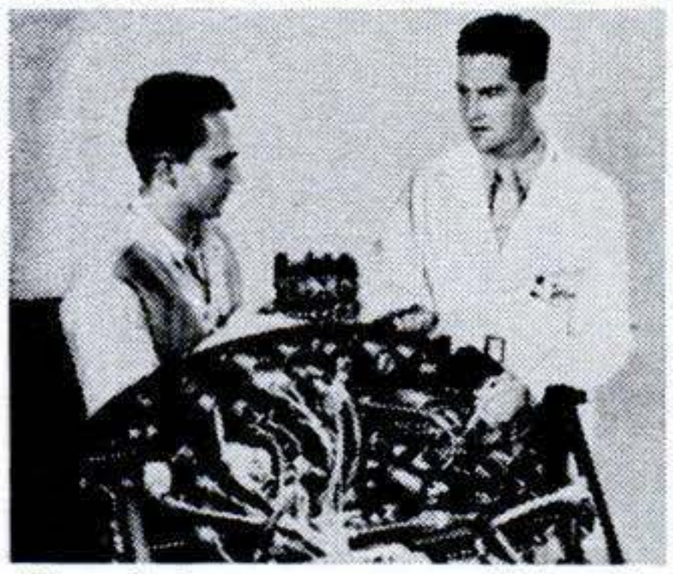
City_____ State_____

Veteran_____ Non-Veteran_____

Residence School_____ Home Study_____

TECHNICAL CRAFTS CORPORATION — Training For Success

BE AN INSTRUMENT TECHNICIAN



Do you like to take things apart and see what makes them tick? Then be the important man who knows how to install, service and maintain delicate instruments in airplanes and industrial equipment. The instrument field offers many opportunities to trained men.

American School of Aircraft Instruments specializes in this important field, and does a fine job for you in only 34 weeks. Many graduates in industry or have own business. Write today for free booklet. Send coupon in envelope or paste on penny postcard.

AMERICAN SCHOOLS OF AIRCRAFT INSTRUMENTS,
Dept. PS-68-4, 5145 W. San Fernando Rd., Los Angeles 26, Calif.
Gentlemen: Please send me free booklet on your training.

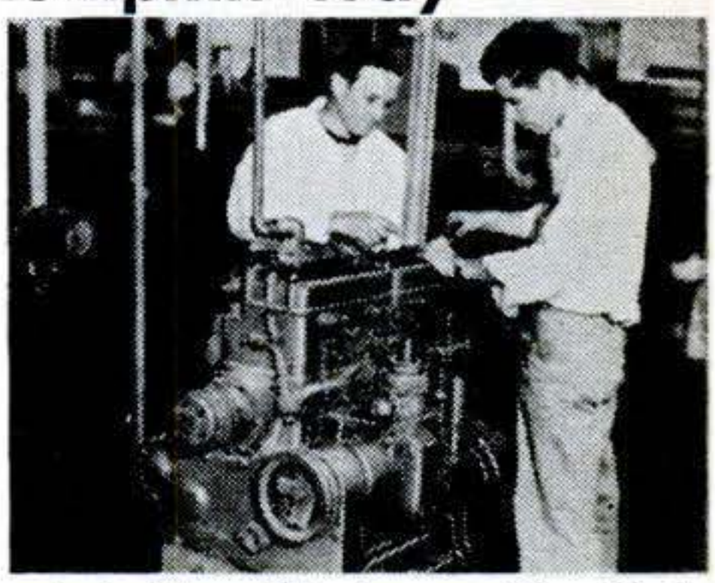
Name (PRINT)_____

Street_____ Age_____

City_____ State_____

Veteran_____ Non-Veteran_____

BE A DIESEL EXPERT the Hemphill Way



Wherever Diesels are used the name "Hemphill" means TRAINED MEN who *know* Diesel. Many graduates successfully employed in Diesel industry or have own business. *You* can get this training *at home* NOW, without interfering with your present activity. Or study in Hemphill shops at New York, Memphis, or Los Angeles. Check preference on coupon below. Prepare yourself for the great swing to Diesel this quick, easy way. Mail coupon for complete information.

HEMPHILL DIESEL & AUTOMOTIVE SCHOOLS,
Dept. PS-68-4, 1601 S. Western Ave., Los Angeles 6, Calif.
Gentlemen: Please send me information on your

Home Study Course_____ Shop training_____ in

New York_____ Memphis_____ Los Angeles_____

Name (PRINT)_____

Street_____ Zone_____

City_____ State_____

Veteran_____ Non-Veteran_____

ALL ARE MEMBERS NATIONAL COUNCIL OF TECHNICAL SCHOOLS

SEND COUPON TODAY

Copyrighted material

VETERANS Learn WATCHMAKING

A Lifetime Career

No Age, nor Physical Limitations

YOUR OPPORTUNITY
To Lift Yourself from a Futureless Job

LEARN WATCHMAKING

and earn from the start, higher than average pay . . . easy hours . . . ideal working conditions . . . be prepared to establish your own business.

WATCH REPAIRING—JEWELRY—ENGRAVING
Always in Demand

Requests for our Graduates from Everywhere. Permanent positions (no layoffs) $75.00–$100 per week for trained men. Write today for latest FREE Catalog.

KANSAS CITY SCHOOL OF WATCHMAKING
America's Most Progressive Horological School
619 WYANDOTTE ST. KANSAS CITY 6, MO.

New BRUSH Electroplater

ESPECIALLY BUILT FOR MECHANICS, MODEL MAKERS HOME CRAFTSMEN

For
- MODEL MAKERS
- MAINTENANCE
- HOBBY SHOPS
- HOME SHOPS
- SALVAGE PARTS

Easy to Plate GOLD, SILVER, NICKEL, COPPER, etc... *For Pleasure and Profit!*

If you have a workshop—at home or in business—you need this new Warner Electroplater. At the stroke of an electrified brush, you can electroplate models and projects—you can replate worn articles, faucets, tools, fixtures, silverware, etc. with a durable, sparkling coat of metal... Gold, Silver, Nickel, Copper, Cadmium, *and after a bit of practice*, even Chromium! Everything furnished—equipment complete, ready for use. *By doing a bit of work for others, your machine can soon pay for itself.* So make your shop complete by getting a Warner Electroplater right away. Send today for FREE PLATING SAMPLE and illustrated literature. ACT AT ONCE.

WARNER ELECTRIC CO., Inc., Dept. S20
1512 Jarvis Ave., Chicago 26, Illinois

FREE *Details & Sample!*

WARNER ELECTRIC CO., Inc., 1512 Jarvis Ave., Chicago 26, Illinois, Dept. S20
Gentlemen: Send Free Sample and Details to:

*Name*_____

*Address*_____

*City*_____ *State*_____

STEP INTO THE AUTOMOTIVE INDUSTRY—A TRAINED MAN!

PRACTICAL SHOP TRAINING

IN

AUTOMOTIVE MECHANICS
BODY and FENDER REBUILDING

If interested write or wire

ATLANTA MOTIVE TRADES INSTITUTE Dept. C, 254 IVY St., N.E. Atlanta, Georgia

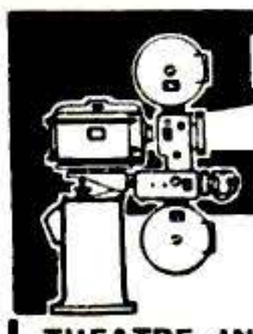
Veterans ask about G I Training

Learn to Write

You can become a good **Business Writer,** and you can learn **Shaded Writing** also at home during spare time by my **Simplified Method,** without cost of going away to school. Easy Lessons. Diploma. Write for my FREE BOOK, "How to Become an Expert Penman," which shows what others have learned. Send 10c for Special Penpoint and your name with a flourished bird written on a card. Write TODAY.

T. M. TEVIS BOX 25R CHILLICOTHE, MO.

LEARN MOVIE PROJECTION THEATRE MANAGEMENT



The Motion Picture Theatre Business offers big opportunities for trained men. Get into a fascinating field with a promising future. Train at home in spare time. Free Catalog. Established 20 years.

THEATRE INSTITUTE, 385 Washington St., Elmira, New York

FOREIGN STAMPS

ENORMOUS BARGAIN!

2,000 foreign stamps, $1.00, **5,000,** $2.00. Order now!

AMERICAN STAMP CO.
Dept. A-4114 Wilmington 99, Del.

Learn PHOTOGRAPHY at Home

Splendid opportunities. Prepare in spare time. Practical basic training. Long-established school. Send for free book, "Opportunities in Photography." No obligation.

American School of Photography, 1315 S. Michigan Ave., Dept. 136A Chicago 5, Ill.

ARTISTS MAKE MONEY

Do you like to draw? Send name, address, age and occupation for FREE ART TEST, to find out your ability.

ART INSTRUCTION, INC.
6148 Art Instruction Bldg., Minneapolis 15, Minn.

SUIT YOURS *AS A BONUS*

And Big Money in Spare Time, Too

We want you to wear this fine made-to-measure suit! Make it yours by sending a few orders, and earn BIG CASH PROFITS in spare time. Your suit will help you get more orders with scores of rich, quality fabrics, tailored-to-measure to newest styles. Also Ladies' Tailored Suits—complete line. Write today for FREE SAMPLES. No experience, no money needed. For quick action tell us about yourself.

J. C. FIELD & SON, Inc.
Harrison and Throop Sts., Dept. F-1721, Chicago 7, Ill.

NEW! MINIATURE DUST MASK

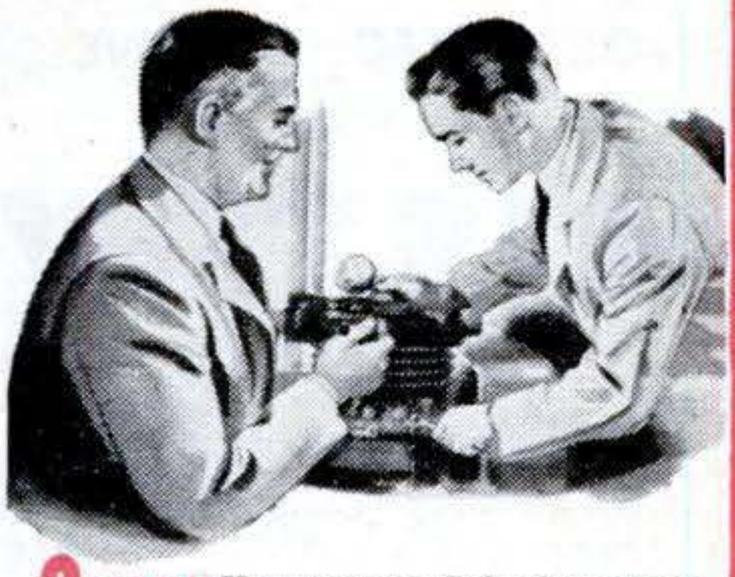
Wear when sanding, grinding, paint spraying, sweeping, dusting, furnace cleaning, etc. Handy as a pair of glasses. Just keep mouth closed and breathe through nose is all you do to operate. Protects against dusts, lint, coal, cement, grain dust. HAY FEVER POLLEN. Has 9 sq. in. filter.

Order Today $1.00 POST PAID

JERRY BRYANT, Dept. PS, 919 N. Michigan Ave., Chicago 11, Ill.

Copyrighted material

1 FIRST: You get vital basic knowledge at home—during spare hours. Train as fast or as leisurely as you like.



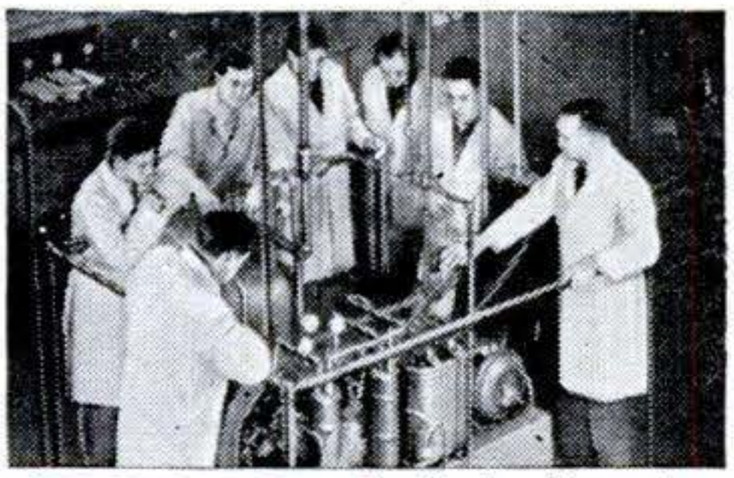
2 THEN: You come to ITI's giant shops in Chicago—for a **Full Four Weeks** of practical instruction and actual work on **newest, most modern equipment.**

Prepare NOW—Start Training in Spare Time for a BETTER JOB in

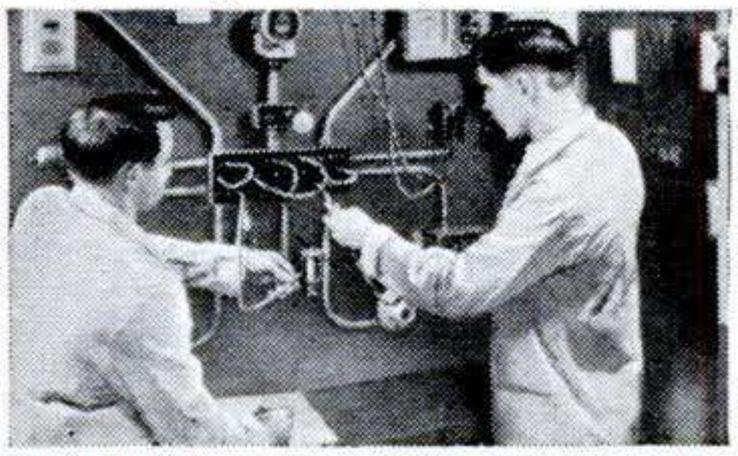
REFRIGERATION AIR CONDITIONING

Good Practical Training Pays Rich Rewards in BIGGER PAY and Steady Advancement

REFRIGERATION—Trained men needed to handle service and repair jobs.



AIR CONDITIONING—Plenty of opportunity in this great industry for trained men.



HEATING—ITI trains you in this big pay field to handle essential service work.

AMERICA'S FOREMOST SCHOOL of PRACTICAL TRAINING

preparing ambitious men for greater opportunities since 1916

••• Now is the time to lay your plans for a better job at better pay! Get the facts about your future in the amazingly FAST GROWING field of Refrigeration, Air Conditioning and Heating! Men who know how to install, repair, rebuild and maintain this equipment are going ahead FAST! But many more fine jobs are open NOW in this rapidly expanding industry in both the home and commercial equipment fields. Experts say the opportunities are almost unlimited . . . BUT ONLY THE PROPERLY TRAINED MEN CAN QUALIFY!

Train at Home and in ITI's Huge Shops

Investigate the Industrial Training Institute's 2-Way Course in Refrigeration, Air Conditioning **AND** Heating. In a few months this training gives you solid, practical, down-to-earth knowledge and experience you need. You don't have to leave home or give up your present job. Then you come to the huge ITI shops in Chicago for FOUR FULL WEEKS of action-packed practical experience!

Interesting, Practical Course

You don't need any special schooling or experience to master the ITI course. Just a desire to learn and advance. Useless theory and dull mathematics have been reduced to a minimum. ITI lesson Work Sheets are easy to read, interesting and 100% practical. The ITI trained man is ready to handle any practical job in the industry. **And ITI helps you find your job!**

TRAINING MEN FOR INDUSTRY SINCE 1916!

ITI Training is backed by more than 30 years of success and experience. We have given training to over 400,000 men since 1916. Today thousands of ITI graduates hold down top paying jobs. ITI occupies five large buildings, with over $500,000.00 invested in shops and training facilities. Instruction staff of more than 150 men. ITI is recognized as the world's foremost school of practical training!

Mail Coupon for FREE Facts!

Find out about ITI Training. See for yourself how easy and simple it is to start at home, in your spare time, and prepare yourself for a fine job with a real future. It's all in ITI's fascinating, illustrated **FREE** book, "Your Future in Refrigeration & Air Conditioning." Just fill out and mail the coupon below NOW! Take this first step toward success TODAY!

VETERANS:

ITI Residence Training is fully approved under the G.I. Bill.

ITI also trains ambitious men for good pay jobs in . . . .

- **Electricity & Industrial Electronics**
- **Machine Drafting & Design**
- **Precision Instruments**

INDUSTRIAL TRAINING INSTITUTE

Formerly the L. L. Cooke School of Electricity & Refrigeration & Air Conditioning Institute

Dept. F-2, 2150 LAWRENCE AVE., CHICAGO 25, ILL.

MAIL COUPON TODAY FOR

FREE BOOK!

Mr. C. H. Smith, President,
INDUSTRIAL TRAINING INSTITUTE
2150 Lawrence Ave.,
Dept. F-2, Chicago 25, Ill.

Please send me FREE the ITI book "Your Future in Refrigeration and Air Conditioning" and information about the opportunities for trained men in this fast growing field. I understand I'm under no obligation.

NAME _____ AGE _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

ARE YOU A VETERAN? _____

Copyrighted material

INVENTORS

When you are satisfied that you have invented a matter of value—write me, without obligation, for full information as to what steps you should take to secure a Patent or Trademark.

The usual first step is to have a search of the prior U. S. Patents conducted, so that I can report to you on the question of Patentability.

PATRICK D. BEAVERS
(Formerly RANDOLPH & BEAVERS)
Registered Patent Attorney
937 Columbian Building, Washington 1, D. C.

PATRICK D. BEAVERS, *Registered Patent Atty.*
937 Columbian Bldg., Washington 1, D. C.

Please send me full information on how to secure Patents & Trademarks.

Name.....

Street.....

City.....*State*.....

for **AMAZING** *Acceleration*

GET THIS
DIXIE WESTERN
Polished Aluminum
DUAL INTAKE
MANIFOLD
For Fords and Mercurys
increases mileage speed and performance

DIXIE WESTERN MANIFOLD CO.
Dept. S. Box 364 Los Angeles 43, Calif.
Gentlemen Please send me.
☐ Dual Manifold Set
☐ Gas Line and Throttle Kit
☐ Chrome Plated Velocity Stack
to fit my_____
(year and make of car)
☐ Check enclosed ☐ Ship C.O.D.
Name_____
Address_____
City_____Zone____State____

DIXIE WESTERN MANIFOLD CO.
Box 364 Los Angeles 43, California

FIREWORKS

CHINESE FIRE CRACKERS

1 Bundle or 1280—1½" Crackers..... $4.50
1 Bundle or 1600—1½" Crackers..... 5.35

BALLOONS—LATEX RUBBER

No. K 10, per gross..... $1.50
No. K 20, per gross..... 3.00

Write Dept. R for Wholesale Quotations.
Send Remittance with Order.

UNITED FIREWORKS MFG. CO., INC.
Dayton 7, Ohio

CHEMISTRY

LEARN AT HOME... Chemical knowledge is essential for thousands of good jobs in industry, business, science. IPC enables you to master practical chemistry. It's the ONLY home study chemistry course which enables you to learn by performing actual experiments—using chemicals and apparatus supplied with the course—in addition to your IPC textbook studies. Compares with recognized college courses in General Chemistry. Write today for free descriptive booklet.

INSTITUTE OF PRACTICAL CHEMISTRY
2 PROSPECT AVENUE, HAGERSTOWN, MD.

SHORTHAND in 6 Weeks at Home

Famous Speedwriting system. No signs; no symbols; no machines; uses ABC's. Easy to learn; easy to write and transcribe. Fast preparation for a job. Surprisingly low cost. 100,000 taught by mail. Used in leading offices and Civil Service. Write for free booklet.

SPEEDWRITING, Dept. 2606-8 55 W. 42 St., N. Y. 18, N. Y.

TALK-SING *thru your own radio with* **RADIO MICROPHONE**

Be the life of the party. Put on your own broadcasts at home. Talk-Sing, make announcements from any room. Wonderful voice practice. Microphone easily attached to any radio. Follow enclosed instructions. SEND NO MONEY—pay Postman $2.25 plus postage. Send Money Order or check and save postage.

EMPIRE RADIO & TELEVISION CO. (Dept. S. I.) 1521 Bedford Ave., Brooklyn 16, N. Y.

★ PSORIASIS ★

PSORIASIS SUFFERERS: Has everything failed to bring even temporary relief from scales, lesions and itching? Then write today for FREE important information. You needn't invest one cent!

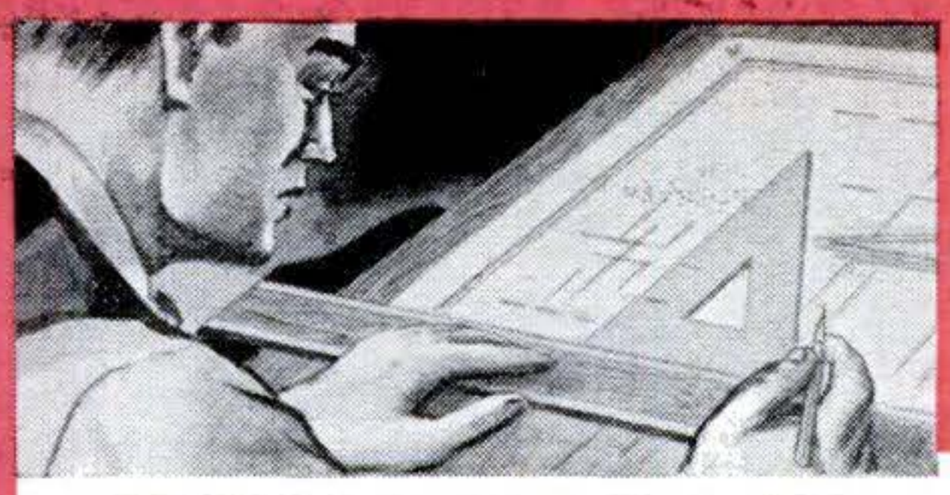
PIXACOL CO., Dept. S-6, Box 3583, Cleveland, Ohio

3 In 1 AIR PISTOL

SPORTSMAN JR.—Sensational, low-priced air pistol. Ruggedly built, full size target gun shoots either standard BBs, pellets or steel darts. Fast, single-action compression chamber. Single shot, silent shooting. Use indoors or outdoors. Modeled after famous target pistol. Economical to operate. Die cast all metal non-slip moulded grip; machined steel chamber and barrel. 8-in. long; 4½-in. deep; full size, weighs 15 oz. **EACH $3.49**
BBs, 3 pkgs. 25c; .177 pellets, 500 for $1.50; steel darts. 35c package. (Holster 50c) Order Plenty.

We ship C.O.D.
JOHNSON SMITH & COMPANY, Dept. B-77, Detroit 7, Michigan

Copyrighted material



GET INTO

DRAFTING

The Draftsman Plays a most Important Part in INDUSTRY

DRAWING OUTFIT INCLUDED
with Drafting courses.

All the tools you need including folding drawing table. With them you can put your ideas on paper quickly and with accuracy. With training you are all set to master Drafting in months, —not years—at home.

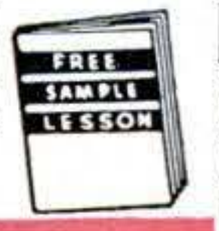
Learn in Spare Time—At Home!
(or at the College in Chicago)

A few hours of pleasant home study every week—that's all. With Chicago Tech's help, you train yourself step by step. This tested method—developed over 44 years of C.T.C. progress —prepares men for good positions in industry.

Practically everything that's built or manufactured these days is constructed from blue print drawings prepared by the draftsman. He is the KEY man in industry. No new machines can be built, no bridges erected, no buildings constructed until the draftsman has completed his work.

Drafting is clean, interesting, professional-type work. The draftsman is paid well to start. And he has real opportunities for advancement to high-pay jobs in Engineering. The tremendous production programs ahead in industry will require more draftsmen than ever before.

Send today for free information. See what this training has done for others, what it can do for you. Simply MAIL COUPON TODAY in an envelope or use a penny postcard.



CHICAGO TECHNICAL COLLEGE
G-225 Tech Building, 2000 South Michigan Ave.
Chicago 16, Illinois

MAIL COUPON NOW

CHICAGO TECHNICAL COLLEGE
G-225 Tech Bldg., 2000 So. Michigan Ave., Chicago 16, Ill.
Mail me FREE Drafting Lesson with information about big opportunities in DRAFTING and how I can train at home.

☐ Architectural Drafting ☐ Electrical Drafting
☐ Machine Drafting ☐ Structural Drafting
☐ Builders' Course

Name.....Age.....
Address.....
City.....Zone...State.....

WHICH OF THESE *Opportunities* INTERESTS *You* MOST?

● *Today,* choose the job you want—and prepare for it. Or if you are already engaged in the work you like best, start training *now* for quicker promotion. Acquire the knowledge that will help you to get ahead faster, make more money and have greater security.

American School, founded in 1897 as an educational institution *not for profit,* can help you to reach your goal just as it has helped others during the past fifty-one years. Check the coupon at right, add your name and address and mail it at once. The school will send you details on its training plan and outline of study prepared by specialists. There is no charge, no obligation, so send the coupon immediately.

AMERICAN SCHOOL
Dept. GA-46, Drexel at 58th Street, Chicago 37

CHECK, CLIP AND MAIL COUPON NOW

AMERICAN SCHOOL, Dept. GA-46, Drexel at 58th, Chicago 37, Ill.
Without obligation, Please send FREE and postpaid, bulletin and details of the Subjects checked:

☐ PLASTICS ENG'R
☐ Refrigeration
☐ Architecture and Building
☐ Contracting
☐ Practical Plumbing
☐ Automotive Engr.
☐ Aviation Drafting
☐ Aviation
☐ Business Management
☐ Accounting
☐ Electrical Engr.
☐ Electricity-Pract.
☐ Electronics, Industrial
☐ Bookkeeping
☐ Private Secretary
☐ Diesel Engineering
☐ Sheet Metal Pattern Drafting
☐ Railway Training
☐ Drafting and Design for Men and Women
☐ Radio
☐ High School
☐ Air Conditioning
☐ Mechanical Eng.
☐ Shop Management
☐ Tool Making
☐ Better Foremanship
☐ Machine Shop Operations

Name.....*Occupation*.....
Address.....*Age*.....
City.....*State*.....

Copyrighted material

Don't Gamble with your Savings

PROTECT YOURSELF

in case you enter a hospital on account of

SICKNESS or ACCIDENT

The New Family Mutual Hospitalization Plan Protects your entire family. Costs only 3¢ a day for adults, 1½¢ a day for children.

FOR SICKNESS OR ACCIDENT

Hospital Room and Board up to	$6.00 a day for 30 days
Operating Room up to	$10.00
X-Ray Examinations up to	$10.00
Laboratory Examinations up to	$10.00
FOR ACCIDENT	
Ambulance up to	$10.00
Emergency Accident—Dispensary up to	$6.00
Loss of Limbs, sight, etc., or loss of life up to	$500.00
Maternity Indemnity up to	$35.00
Identification Service up to	$100.00

Don't let hospital bills wipe out your life savings in a few weeks. Be protected against hospital bills in case sickness or accident strikes you. Under this new Family Mutual plan, you will be able to pay your hospital bills resulting from sickness and disease or bodily injury. You may choose any hospital in the United States. Benefits for children are one-half those paid to adults.

DON'T DELAY— MAIL THE COUPON TODAY

FAMILY MUTUAL LIFE INSURANCE CO., WILMINGTON 99, DEL.

Family Mutual Life Insurance Co. Dept. N-2
601 Shipley St., Wilmington 99, Del.

Please send me, without obligation, complete information on your Economical Hospitalization Plan.

NAME _____

ADDRESS _____

CITY _____ STATE _____

Mows and Trims Lawns

In One Simple Easy Operation 8¼ Lbs.

Save Time and Labor with a

MONTAMOWER

New model. New type metal handle has special device to adjust cutting height. Drive shaft now mounted on free rolling, factory lubricated, sealed ball bearings. No tired backs or aching arms. 8¼ lbs. live precision made mechanism that first gathers, then cuts smoothly a clean 16" swath through grass, dandelions, spike grass, lawn weeds. No noise or clatter. As modern and efficient as your electric razor. Cuts right up to walls, fences, trees or posts; leaves no fringes to be trimmed by hand. Cutters self-sharpening. Built to last many years. Many thousands in use. Sold direct from factory for 26 years. Costs little. Write at once for trial on your own lawn "approval offer," guarantee information and literature.

MONTAMOWER DISTRIBUTING CO.

830 Keeler Bldg. GRAND RAPIDS 2, MICHIGAN

DRAINS CELLARS, WASH TRAYS CIRCULATES OIL

Pumps 1800 GPH 300 gal. 30' high, uses ⅛ to ⅓ HP motor. Will not clog. **$6.50**

Postpaid if cash with order.
(Add 50c for west of the Mississippi.)

Thousands in use since 1936

LABAWCO PUMPS, BELLE MEAD 3, N. J.

Learn MECHANICAL DENTISTRY

A profession offering unlimited opportunities. Most modern and complete course embracing every branch from Plate to Porcelain Work, which prepares you to work for Dentists or start your own business. Individual instruction—practical training in day or night school. No books—no classes. Catalog upon request.

McCARRIE SCHOOL of Mechanical Dentistry, 207 N. Broad St., Dept. 875, Philadelphia, Pa.

EXCITING FILMS

Extraordinary and unusual 8-16mm. Silent and Sound Films to thrill your Home Movie Audiences.

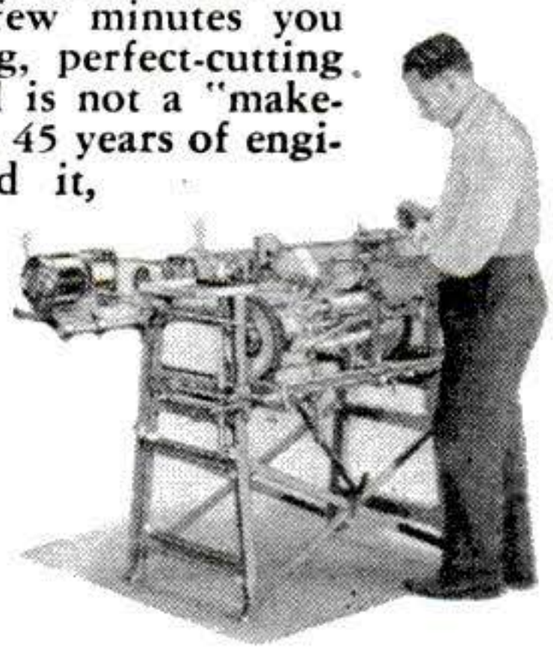
For Sample Film and Special List send only 10c to...

EXCITING FILMS 1071 EL CENTRO HOLLYWOOD 38, CAL.

You Can Make Up to $5.00 Per Hour with the IDEAL

THERE are hundreds of lawnmowers in your neighborhood that will need sharpening at least once or twice each season. You can build up a profitable business with the Ideal Lawnmower Sharpener, and earn up to $5.00 an hour while doing it.

You need no experience to operate the Ideal Lawnmower Sharpener. Just place the lawnmower in the Ideal, make a few simple adjustments, and in a few minutes you have a smooth-running, perfect-cutting lawnmower. The Ideal is not a "makeshift" sharpener, it has 45 years of engineering design behind it, . . . is sturdily built, and grinds both straight blade and reel knives to a precision-cutting edge. Write today and learn what the Ideal Lawnmower Sharpener can do for you.



DON'T DELAY

Send For FREE Book

The FATE-ROOT-HEATH CO.

DEPT. D-4, PLYMOUTH, OHIO

RUPTURED?

Get Relief This Proven Way

Why try to worry along with trusses that gouge your flesh—press heavily on hips and spine—enlarge opening—fail to hold rupture? You need the Cluthe. No leg-straps or cutting belts. Automatic adjustable pad holds at real opening—follows every body movement with instant increased support in case of strain. Cannot slip whether at work or play. Light. Waterproof. Can be worn in bath. Send for amazing **FREE** book, "Advice To Ruptured," and details of liberal truthful 60-day trial offer. Also endorsements from grateful users in your neighborhood. Write:

Cluthe Sons, Dept. 14, Bloomfield, New Jersey

Copyrighted material

AMERICA'S GREATEST ELECTRICAL SCHOOL OFFERS YOU

MORE EQUIPMENT! MORE SPACE! MORE TRAINING!

OVER 1000 PIECES of ACTUAL ELECTRICAL EQUIPMENT to WORK ON!

Learn ELECTRICITY

In NATION'S LARGEST EXCLUSIVE ELECTRICAL SCHOOL

It's Easy - "LEARN-BY-SEEING" MOVIES
It's Fast - "LEARN-BY-DOING" METHODS

and its THOROUGH! . . . There is *no other place—no other way* to get the same all-around training you get at M.T.I. NOT A HOME STUDY COURSE! . . . You get actual "hands-on-equipment" training in great MODERN SHOPS in Detroit. No previous experience necessary. Learn HOUSE WIRING, A.C., D.C. MOTORS, ARMATURE WINDING, POWER PLANT WORK, etc. New classes start every few weeks. Part time work available. Living arrangements made.

NO COST TO VETERANS *Train at Gov't. expense. Receive $75 to $120 month while learning Coupon brings details.*

MICHIGAN TECHNICAL INSTITUTE
Department PS-6, 2281 West Fort Street, Detroit 16, Michigan

MAIL TODAY FOR QUICK ACTION!

MAKE MORE $$$$

MICHIGAN TECHNICAL INSTITUTE, Dept PS-6
2281 W. Fort St., Detroit 16, Michigan

☐ Send me catalog and complete information.
☐ I am a GI. Send special information.
☐ Married. ☐ Single

NAME _____
ADDRESS _____
CITY _____ ZONE ____ STATE ____

IMAGINE THEIR JOY WHEN THEY FOUND THEY COULD PLAY

this easy-as-ABC way!

LEARNED QUICKLY AT HOME
"I didn't dream I could actually learn to play without a teacher. Now, when I play for people they hardly believe that I learned to play so well in so short a time."
*H.C.S., Calif.

PLAYS AT DANCES
"Your lessons have been most satisfactory. I can play all of the popular songs. I have earned money playing at dances."
*E.N.J., New York.

PLAYS ON RADIO
"I can't keep from telling you that I have a good position playing from KTHS, Hot Springs, Ark., every morning." *J. S., Okla.

What Instrument Would You Like to Play?

JUST name your instrument and we'll show you how you can learn to play it—quickly, easily, in spare time at home. Never mind if you don't know one note of music from another—don't worry about "special talent." And forget all you've ever heard about music being hard to learn.

The truth of the matter is that *thousands now play who never thought they could!* Yes, men and women everywhere have discovered this amazingly easy way to learn music at home. Now they are enjoying the thrilling satisfaction of playing the piano, violin, guitar, saxophone or other favorite instruments. Some of them are playing in orchestras and over the radio; others are teaching music, making money in spare or full time. And thousands are having the time of their lives playing for their own enjoyment and the entertainment of their friends.

LEARN TO PLAY BY NOTE
Piano Guitar
Violin Saxophone
Organ Mandolin
Tenor Banjo
Hawaiian Guitar
Piano Accordion
Or Any Other Instrument

No tedious study and practice, no tiresome exercises. You learn to play *by playing*—start right in with the melody of a simple tune! It takes only a few minutes a day; the cost is trifling. Does it sound too good to be true? Mail the coupon and get the FREE PROOF!

FREE PRINT AND PICTURE SAMPLE

Fascinating booklet answers all your questions; free Print and Picture Sample shows how method works. Instruments supplied when needed, cash or credit. U. S. School of Music, 86 Brunswick Bldg., New York 10, N.Y. 50th Year.

**Actual pupils' names on request. Pictures by professional models.*

U. S. SCHOOL OF MUSIC
86 Brunswick Bldg., New York 10, N. Y.

I am interested in music study, particularly in the instrument indicated. Please send me your free illustrated booklet, "How to Learn Music at Home" and the Free Print and Picture Sample.

Name _____ (PLEASE PRINT)
Address _____
Instrument _____ Have you Instrument ? _____

Copyrighted material

A PROFITABLE BUSINESS OF YOUR OWN?

OF COURSE! HERE'S HOW ➤

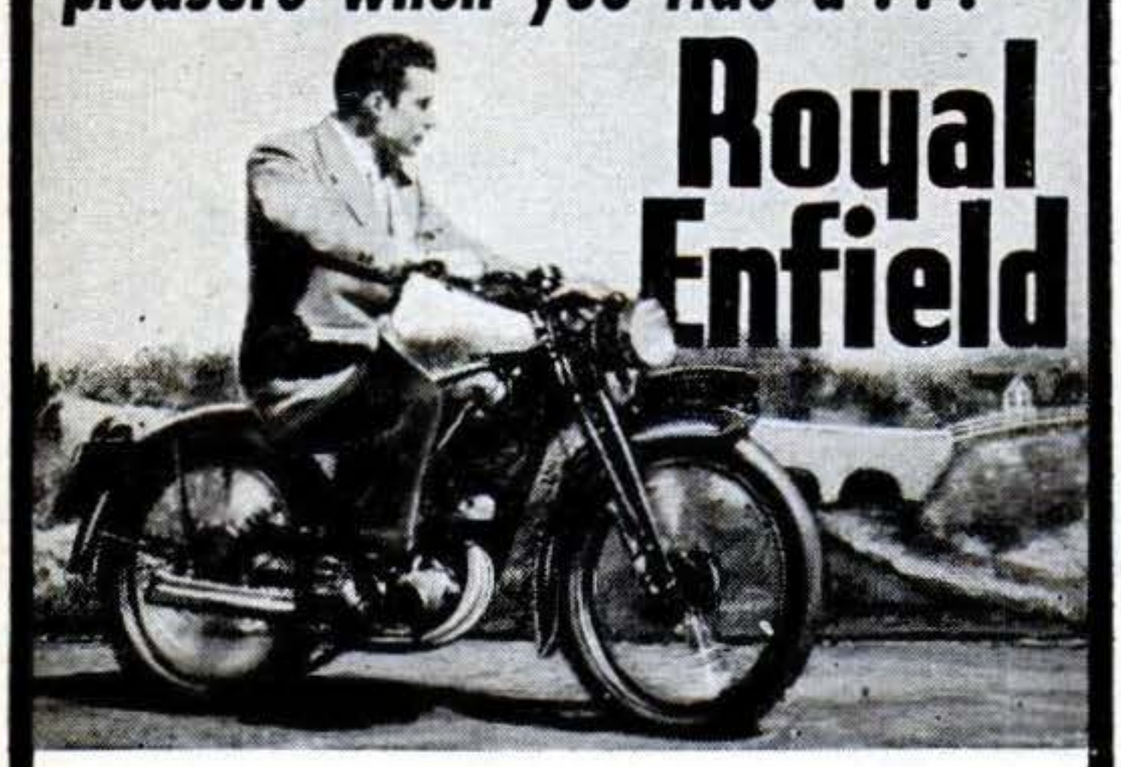
THE *Scimitar* SELF-POWERED LAWN MOWER IS THE ANSWER!

The American Way is the only way! Here is a product that will establish a future for you in a business *all your own*. The ownership of a Scimitar will make you financially independent. Own the *best* self-powered lawn mower on the market! It cuts within ½" of trees and buildings, under hedges and shrubs. Adjustable cutting heights from ½" to 3", but will cut heavy growth with ease. Trouble free, rapid performance and a *money-maker*. Remember, *it will cut one acre per hour.*

WRITE NOW!
WE WILL SEND FULL PARTICULARS

POWER DEVELOPMENT CORP.
6719 DENISON AVENUE • CLEVELAND 2, OHIO

Everything you want for outdoor pleasure when you ride a . . .



FAMOUS ENGLISH LIGHTWEIGHT MOTORCYCLE RUNS
100 MILES ON A GALLON OF GAS

Up and go—with the rugged new Royal Enfield popular Model R.E. Style, safety, flexibility, 125 c.c. 2-stroke, single cylinder engine, 3-speed gears; 45 m.p.h. Write today for folder "S", for complete details. Also 350 c.c. and 500 c.c. models are immediately available.

Dealer inquiries given prompt attention.

WHITEHALL DISTRIBUTORS, Inc.
1385 Commerce Avenue, New York 61, N. Y.

Have an OFFICE OF YOUR OWN!

LEARN NEW PROFITABLE PROFESSION
At Home in 60 Days, Men & Women, 18 to 70!

Be Your Own Boss and the Boss of Others. Be Respected. Meet Interesting People.

Earnings of men and women in this profession run as high as $5,000-$15,000 yearly. Others make good money in spare time. Little money needed to start. A business where your earnings begin sooner. Easy to learn. No selling or goods to buy. No experience necessary. A depression-proof business. A course of action to guide you step by step as you earn. All 53 lessons sent at once to use as operating manuals. Easy terms. Diploma. Money-back agreement. Write for **FREE BULLETIN.**

BY MAIL in *Easy Lessons*

FRANKLIN CREDIT SCHOOL
Dept. 71-F ROANOKE 7, VIRGINIA

COLOR AT A PRICE YOU CAN AFFORD TO PAY

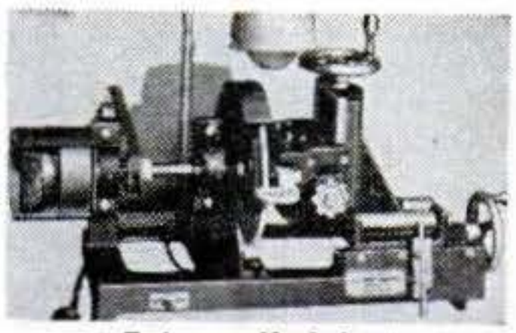
"PHOT-O-CHROME"

"SPARKLING COLOR PRINTS"
Made From Any Ansco, Ektachrome or Kodachrome Transparencies

2½ x 3½ **50c** (unmounted)

5 x 7 . . . 2.50 8 x 10 . . . 4.00

CLEVELAND COLOR SERVICE
3974 EAST 131st STREET CLEVELAND 5, OHIO



Start a NEW BUSINESS Or Add to Your Present Repair Business

Sharpen Dull Pipe Wrenches
Pipe Taps & Dies
"Gum" Circular Saws

Write for information.

Pat. applied for

J. C. MOORE INDUSTRIES P.O. Drawer 276 FREDONIA, PA.

Free Sample!

Be the first to sell amazing, new GLOW IN THE DARK house numbers, switch plates, pictures, decals, religious articles, etc., etc. Represent a large manufacturer. Wonderful opportunity. BIG PROFITS. Write at once for FREE SAMPLE.

MADISON MILLS, Dept. F-5.
303 Fourth Ave., New York 10, N.Y.

DETECTIVES

Home Study in Detective Training—Professionally Modernized —Recognized Instructors—Easy Payments—Write

INTERNATIONAL DETECTIVE TRAINING SCHOOL
1701-P Monroe St. N. E. Washington 18, D. C.

If Ruptured

Do What Others Now Do—

Wear a Form Fitting MILLER Truss

which provides natural freedom and comfort in working, walking, playing, horse back riding, dancing, swimming or sleeping. You just cannot afford to be without this protection and convenience.

Wear two weeks then consult your physician before deciding to keep it.

Write me today for **FREE** descriptive circular. Sent in plain, sealed envelope.

FRED B. MILLER Manufacturer
Dept. P.S. Hagerstown, Maryland.

Copyrighted material

$9.95 TAKES ALL THREE BIG BARGAINS

1. AUDIO AMPLIFIER. Undreamed of value. Uses 6V6's. Has 4 microphone inputs brought to jacks at rear panel. Various output impedances available at rear panel connections. Steel case with chrome handles. 9" long x 9" high x 6" deep. Tubes included. New in original carton. Shipping weight 15 lb. SUPER SPECIAL—$4.95 while supply lasts.

2. RADIO HEADSETS. Latest supersensitive type with rubber earpieces. Every pair guaranteed perfect. $.59 per pair OR 3 PAIRS FOR $1.00.

3. HOME WORKSHOP AT BARGAIN PRICE. Accurate and precise 2 speed guaranteed hobby lathe, the essential machine for the home workshop. Sturdy enough for light production work or factory standby service. Supplied with 56" of belting for connecting to any available electric motor or power take-off, such as on a jeep or tractor. Also included in this unbelievable offer are such accessories as a ½" drill chuck with specially hardened tool steel jaws, a 4" electric furnace high speed grinding wheel, a cotton buffing wheel with a large supply of buffing compound, and a 4" steel wire scratch brush. Your cost $6.00. Sole export agent. Distributor inquiries invited.

ORDER NOW—DON'T DELAY—NO C.O.D.s

BUFFALO RADIO SUPPLY Dept. 4M 219 Genesee St. Buffalo 3, N. Y.

SEND FOR THIS FREE!

Make money. Know how to break and train horses. *Write today for this book FREE*, together with special offer of a course in Animal Breeding. If you are interested in Gaiting and Riding the saddle horse, check here ( ) *Do it today—now.*

BEERY SCHOOL OF HORSEMANSHIP
Dept. 586 **Pleasant Hill, Ohio**

LEARN TO DRAW & PAINT

LANDSCAPES, PORTRAITS, FIGURES, ANIMALS.
No Previous Training Necessary

IF YOU LIKE TO DRAW YOU HAVE TALENT YOU CAN DEVELOP THAT TALENT THROUGH OUR **HOME STUDY COURSE** LEARN TO DRAW AND PAINT IN YOUR SPARE TIME. WRITE FOR INFORMATION.

JOHN CLINTON ART INSTITUTE, Inc.
STUDIO C **PALM BEACH** **FLORIDA**

THERE'S MONEY IN CARTOONS!

RAYE BURNS will teach you HOW to CREATE ORIGINAL CARTOONS **at home** that you may SELL! Course contains **26 lessons** and **over 600 illustrations.** All for *Only..* **$2.85**
Send name and address for free details.

RAYE BURNS SCHOOL, Dept. S, Box 3583, CLEVELAND, OHIO

TRAIN NOW FOR AN

AVIATION CAREER

IN SUNNY SOUTHERN CALIFORNIA

MAXIMUM TRAINING IN MINIMUM TIME

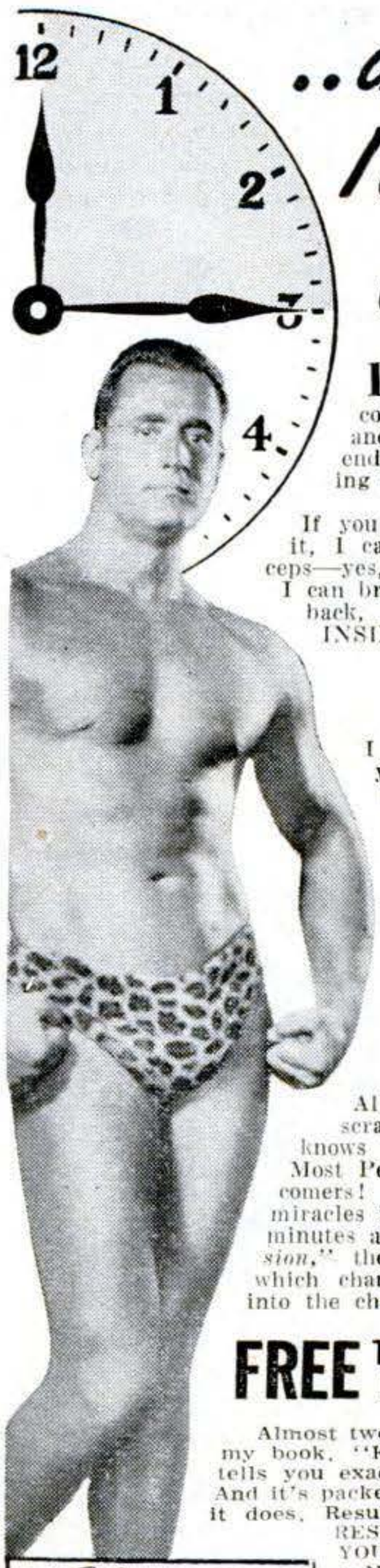
Specializing in AERONAUTICAL ENGINEERING and MASTER AVIATION MECHANICS since 1929 . . . America's Finest Aeronautical Institute . . . 7000 successful graduates . . . MAKE MORE MONEY . . . MAIL COUPON TODAY. APPROVED FOR VETERANS.
Board and Room now available.
Without obligation, send free catalogue with full information.

PS-6

NAME _____ AGE _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

CAL-AERO TECHNICAL INSTITUTE
GRAND CENTRAL AIR TERMINAL • GLENDALE 1, CALIFORNIA

Lend Me 15 Minutes A Day



..and I'll prove I can make you a NEW MAN

I'M trading in old bodies for new! I'm taking men who know that the condition of their arms, shoulders, chests and legs—their strength, "wind," and endurance—is not 100%. And I'm making NEW MEN of them!

If you can simply raise your arm and flex it, I can add SOLID MUSCLE to your biceps—yes, on each arm—in double-quick time! I can broaden your shoulders, strengthen your back, develop your whole muscular system INSIDE and OUTSIDE!

What Only 15 Minutes a Day Can Do

I can add inches to your chest, give you a vise-like grip, make those legs of yours lithe and powerful. I can shoot new strength into your old backbone, exercise those inner organs help you cram your body so full of pep, vigor and red-blooded vitality that you won't feel there's even "standing room" left for weakness and that lazy feeling! Before I get through with you I'll have your whole frame measured" to a nice, new, beautiful suit of muscle!

I Was a 97-lb Weakling

All the world knows I was ONCE skinny, scrawny 97-pound weakling. And NOW it knows that I won the title, "The World's Most Perfectly Developed Man." Against all comers! How did I do it? How do I work miracles in the bodies of other men in only 15 minutes a day? The answer is "*Dynamic Tension*," the amazing method I discovered and which changed me from a 97-pound weakling into the champion you see here!

FREE THIS FAMOUS BOOK "EVERLASTING HEALTH AND STRENGTH"

Almost two million men have sent for and read my book, "Everlasting Health and Strength." It tells you exactly what "*Dynamic Tension*" can do. And it's packed with pictures that SHOW you what it does. Results it has produced for other men. RESULTS I want to prove it can get for YOU! Learn how you can actually become a NEW MAN, right in the privacy of your own home and in only 15 minutes a day! Mail this coupon NOW! CHARLES ATLAS, Dept. 1-F, 115 East 23rd St., New York 10, N. Y.

Charles Atlas

Actual photo of the man who holds the title, "The World's Most Perfectly Developed Man."

CHARLES ATLAS, Dept. 1-F,
115 East 23rd St., New York 10, N. Y.

I want the proof that your system of "*Dynamic Tension*" will help make a New Man of me—give me a healthy, husky body and big muscular development. Send me your free book, "Everlasting Health and Strength.

Name..... Age.....
(Please Print or Write Plainly)

Address.....

City..... State.....

Copyrighted material

AUDELS Carpenters and Builders Guides 4 vols. $6

Inside Trade Information for Carpenters, Builders, Joiners, Building Mechanics and all Woodworkers. These Guides give you the short-cut instructions that you want—including new methods, ideas, solutions, plans, systems and money saving suggestions. An easy progressive course for the apprentice and student. A practical daily helper and Quick Reference for the master worker. Carpenters everywhere are using these Guides as a Helping Hand to Easier Work, Better Work and Better Pay. To get this assistance for yourself, simply fill in and mail FREE COUPON below.

Inside Trade Information On:

How to use the steel square—How to file and set saws—How to build furniture—How to use a mitre box—How to use the chalk line—How to use rules and scales—How to make joints—Carpenters arithmetic—Solving mensuration problems—Estimating strength of timbers—How to set girders and sills—How to frame houses and roofs—How to estimate costs—How to build houses, barns, garages, bungalows, etc.—How to read and draw plans—Drawing up specifications—How to excavate—How to use settings 12, 13 and 17 on the steel square—How to build hoists and scaffolds—skylights—How to build stairs—How to put on interior trim—How to hang doors—How to lath—lay floors—How to paint.

AUDEL, Publishers, 49 W. 23rd St., New York 10, N. Y.

Mail Audels Carpenters and Builders Guides, 4 vols., on 7 days' free trial. If OK I will remit $1 in 7 days and $1 monthly until $6 is paid. —Otherwise I will return them. No obligation unless I am satisfied.

Name_____

Address_____

Occupation_____

P.S.M.

Employed by_____

ORDER NOW! JULY 4th FIREWORKS

WHOLESALE PRICE

470 PIECES $4.98

ACTUAL RETAIL VALUE $13.55

YES SIR! 470 OR MORE NOISE AND BEAUTY PIECES FOR ONLY $4.98. Magnificent assortment—each a knock-out! Gorgeous, colorful, NEW displays—intricate artistic effects—all merchandise brand-new! For only $4.98 you'll get—Sparklers, Salutes, Red Trail Blazers, Roman Candles, Two-Shot Repeaters, Magic Black Snakes, Cones, Dago Flash Bombs, Three-Shot Automatics, Magic Flames, Airplane Flares, Chinese Rockets, Red Rocket Sky Whistle Bombs, "T-N-T" Flash Salutes, Z-Brand Chinese Firecrackers, Happy Chinese Firecrackers, FREE PUNK!

Order this wonderful over-470-Piece Fireworks Bargain TODAY! Send money order, bank draft, or certified check for $4.98. Do NOT send cash. NO C.O.D. orders! PRINT name and address plainly. Give name of your Express office. Fireworks cannot be mailed. All shipments by Express, F.O.B. at Fort Worth.

ASK FOR FREE CATALOG MANY OTHER ASSORTMENTS

Stars and Stripes Fireworks Co.

P. O. BOX 486, DEPT. PS
FORT WORTH 1, TEXAS

NOT INTENDED TO OFFER FOR SALE IN LOCALITIES WHERE REGULATIONS PROHIBIT

Practical Shop Training

in

REFRIGERATION
AIR CONDITIONING

and/or

PRACTICAL ELECTRICITY
MAJOR APPLIANCES

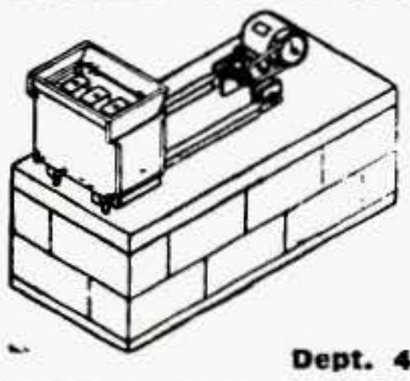
Service, Maintenance, Installation

Train in the Magic City of the South

Write for Details

COMMERCIAL TRADES INSTITUTE
202 SO. 20TH ST., BIRMINGHAM, ALA.
Veterans Inquire About GI Training

BUILD THIS CONCRETE BLOCK MACHINE



Sell blocks; or build your home, garage, barn, or filling station at 1/3 cost by making and laying your own blocks.

This simple machine which you can build yourself at a cost of $15 (excluding motor) will make a block in 30 seconds using only one form. Mass production can be achieved by a new simple method of removing blocks which allows two to four forms to one vibrator. Power driven concrete mixer plans also. Send dime for details and "How to Make and Lay Blocks" folder.

U-BUILD-IT SERVICE
Dept. 4-A, 206 West Wilder St., Tampa 3, Florida

HELP FOR INVENTORS

Hundreds of manufacturers have requested our assistance in locating marketable new products.

Complete information, free.

INSTITUTE of AMERICAN INVENTORS
Dept. 3, 1926 Eye St. N.W., Washington 6, D. C.

INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH
Registered Patent Attorney
205 Columbian Building, Washington 1, D. C.

PATENTS AND TRADE MARKS

C. A. SNOW & CO.
REGISTERED PATENT ATTORNEYS
WRITE FOR INFORMATION TO
246 SNOW BUILDING, WASHINGTON 1, D. C.

INVENTORS

IF YOU WISH TO PROTECT YOUR INVENTION,
You should take steps to protect it by a U. S. Patent. Write me for "Record of Invention" form.

CARL MILLER
REGISTERED PATENT ATTORNEY

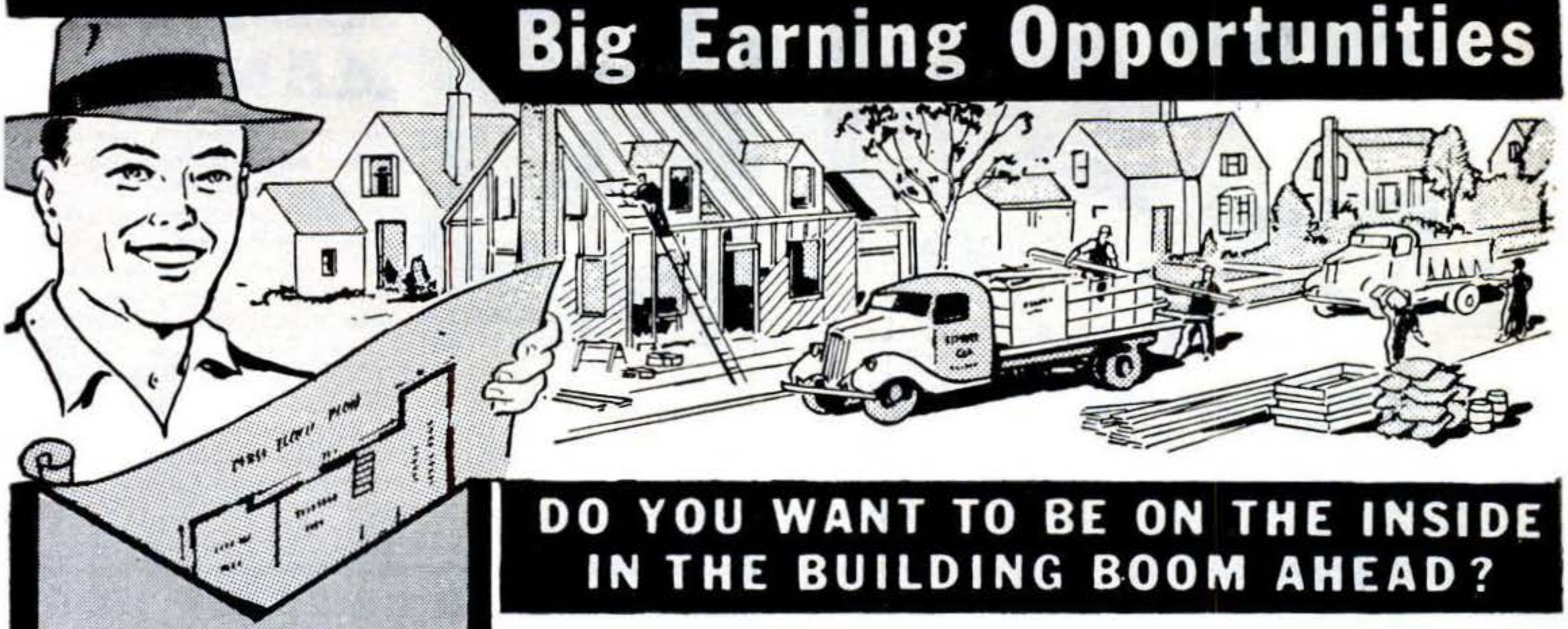
Woolworth Bldg., 35th Floor, Dept. 68-C, New York City
Please send me "Record of Invention" form.

NAME.....

ADDRESS

BE A BUILDING CONTRACTOR

Big Earning Opportunities



BUILDING CONTRACTING

FREE...

Important Information Telling How To Get Started.

LEARN ABOUT the HOME BUILDERS TRAINING INSTITUTE PLAN...

Essential facts whether you are a tradesman in the building field or whether you have no previous experience.

Action Going On Now in the Building Industry.

MAIL COUPON TODAY FOR FREE ILLUSTRATED BROCHURE

DO YOU WANT TO BE ON THE INSIDE IN THE BUILDING BOOM AHEAD?

■ Big years right ahead in Building. Right now eighteen million Americans who do not own homes are being educated to advantages to them in home ownership! Do you want to be on the inside in the building boom—where big money is made? This is your chance now. Learn about opportunities for Building Contractors whether or not you have previous experience in this field. Millions of dollars are going to be made in home and farm buildings, in construction of stores, garages, small industrial buildings.

BUILDING INDUSTRY NEEDS MEN WITH ORGANIZING ABILITY

■ The Building Industry uses men with organizing ability by the thousands in construction, supervision, management, sales. Properly trained men needed in production, distribution, finance, installation, marketing. Government estimates housing demand at 40 billion dollars!

PRACTICAL HOME STUDY TRAINING—EASY TO LEARN BY THIS PLAN

■ Home Builders Training Institute has developed a training program that makes rapid progress possible. Gives you the all around training you want to prepare you for your advancement. Modern methods making use of visual aid illustrations make it easy to learn. From very first lesson assignments the type of information provided is the kind that can be useful to a man taking part in building.

GET FREE INFORMATION NOW MAIL COUPON—NO OBLIGATION

Others are preparing to get in now! Act immediately! To delay preparing yourself is certainly to put yourself at a disadvantage. The building industry is going forward rapidly. Fill out, mail coupon today. No obligation.

Home Builders Training Institute, Dept. D1-6

Billions for Housing Needs

According to a report called "America's Needs and Resources" made available by the Twentieth Century Fund, a capital expenditure of $85,000,000,000 to $87,000,000,000 would be needed to fulfill America's housing needs in the next few years.

The building boom will last for many years. Prompt action now will get you started now—will put you in line for a big-paying job or a business of your own.

FILL OUT—CUT OUT—MAIL TODAY

FACTS FREE for Men Who Want to Get Ahead

Home Builders Training Institute, Dept. D1-6
7050 N. Glenwood Ave., Chicago 26, Illinois

Send free illustrated Brochure and other information about Building Contracting.

☐ **VETERAN** ☐ **NON-VETERAN**

Name .....

Address .....

City ..... State .....

Copyrighted material

S. T. Christensen
President

GET IN ON THE BIG MONEY NOW

It is not unusual for mechanically inclined men to make $5.00 to $6.00 an hour repairing electrical household appliances and factory machinery. Lifetime Security can be yours in the fascinating, revolutionary, Electronic Repair Business. My **CHRISTY Electronic Kit** checks and tests electrical equipment, current consumption, heat controls, shorts, motor winding, etc. and reveals where the repairs are needed. My Christy Course tells in simple, easy-to-understand language how to make each repair, how to build power tools, how to secure business, what to charge, where to get repair parts . . in fact-everything is told.

***Write* NOW!**

GET FULL FACTS BY WRITING NOW!

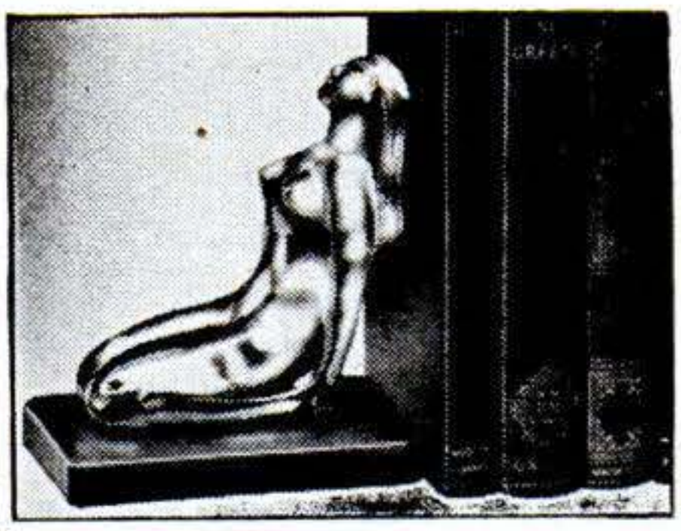
RUSH COUPON TODAY!

MR. S. T. CHRISTENSEN, President
CHRISTY SUPPLY CO., Dept. D-6501,
2835 N. Central Ave., Chicago 34, Ill.
Mail me FREE without obligation complete illustrated information on how to get the Christy Electronic Kit and Christy Appliance Course.

NAME _____ Age _____

ADDRESS _____

CITY _____ STATE _____



NEW LIQUID PLASTIC

Makes Fine Gifts, Novelties, Things to Sell

Have fun, make extra money, with **CASTOLITE** crystal clear liquid plastic. Pours without heat, sets at low temperatures. Make bookends, wall plaques, jewelry, tiles, figurines, coasters. Embed real flowers, butterflies, coins, medals. Preserve treasured photos. **CASTOLITE** can be sawed, carved, turned, drilled. Can be mixed with **CASTOLITE DYES** for brilliant color effects. It's easy to do. You can have the thrill of making things the very first day. No tools are needed.

20-PROJECT CASTO-KIT $3.50
(W. Coast, Can., Mex., $3.75)

CASTO-KIT contains materials and instructions for making useful objects at once. Send check or M.O. for postpaid Kit today, or order C.O.D. For Manual alone, 25c. No overseas shipments. **DEALERS**--write for details.

THE CASTOLITE CO., DEPT. G-4, Box 211, Kenilworth, Ill.

The HAMSTER MANUAL

By Albert F. Marsh

READ THE HAMSTER MANUAL

The most complete guide book on the successful breeding and raising of Syrian Golden Hamsters. Tells all about this new, fast growing, profitable and interesting hobby industry. Reveals all the secrets of the largest breeder of these delightfully profitable pets and laboratory animals. 34 Chapters chuck-full of information gleaned from actual experience as a breeder. Twenty Pages of illustrations. A few subjects are: history, housing, three methods of breeding, easy to get feeds, sexing, fertility vitamins, handling, educational, scientific projects, crating, profits and selling, where to buy and how to sell hamsters. Sent postpaid for $1.00.

Albert F. Marsh, 1524 Basil St., Mobile, Alabama

LEARN AND EARN AT HOME

Learn SCREEN PROCESS, the modern machineless method of printing. Uncrowded, profitable field where trained men are always in demand. 2 BIG KITS OF SUPPLIES we send start many of our students making money even before finishing home study course. Write today for FREE BOOK giving full details. APPROVED FOR VETERANS.

California School Of Screen Process, 3740 Overland Avenue, Dept. S-68, Los Angeles 34

V-8 DUALS & SINGLES

DEALERS WANTED

MUFFLERS
STEELS and ALUMINUMS with a motorboat tone

SINGLES, Chev., V-8, Plymouth, Steels $5.50, Aluminum $7.00. Chry., Olds., Buicks, etc., Steels $7.50, Aluminum $9.00. V-8 and MERCURY DUALS, Steel $17.50, Aluminum $21.00. Split Manifold Sets, Steels $35.00, Aluminum $45.00. Aluminums are guaranteed for life of your car.

SANDEE MUFFLER CO.
BOX 296 LA TIJ, LOS ANGELES 43 CALIF
2624 W. SLAUSON AVE., LOS ANGELES, CALIF.

AUTO BODY & FENDER REBUILDING

Tired of Working for the Other Fellow?
Be Your Own Boss
A Big Field for Your Future

Body & Fender Rebuilding is one of the best paid branches of the automobile industry. Go into business for yourself or prepare for good job opportunities. Train at home or in our big shops. Approved for Veterans. (Non-Veterans inquire about our Low Payment Plan and Pay After Graduation Plan.) Send for FREE Booklet and full information. No obligation.

COMMERCIAL TRADES INSTITUTE, Dept. FI-6
1400 W. Greenleaf Avenue, Chicago 26, Ill.

OUT OF PAWN!

Genuine **DIAMONDS**

Direct to You—Save up to 50% and more on fine quality, Genuine Diamonds, reset in beautiful modern mountings, styled for Ladies and Men—Sold with an Iron-Clad Money-Back Guarantee. Over 100,000 satisfied customers. Order now from this ad. Write us for FREE ILLUSTRATED CATALOG of other Unredeemed Diamond Pledges from $5.00 to $5000. Send today. Reference: Dun and Bradstreet or your own local bank.

1/5 CARAT $125 Value **$49** Tax incl.

1/2 CARAT $200 Value **$95** Tax incl.

BERMAN'S COLLATERAL LOAN BANK
Dept. P.-8, 636-38 W. Balto. St. Baltimore 1, Md.

Copyrighted material

THESE 5 TRADES ASSURE YOU

HIGH PAY • Future Security

- **PLUMBING** Every phase of plumbing Pipe-Cutting and Threading. Lead-Wiping. Rough-in Projects on Installations. Completed Installations of entire plumbing systems Blueprint reading Estimating
- **DRAFTING** College-level courses in General Machine and Architectural Drafting. with fundamentals in Drafting Mathematics—all under graduate engineers
- **SHOE REPAIRING** From simplest repairs on boots and shoes to the finest details of reconditioning and rebuilding. under expert craftsmen
- **ELECTRICAL** Technical and shop training include Basic Electricity. Residential Wiring. Industrial Wiring. General Testing and Trouble Shooting. and Appliance Repair
- **AUTOMOTIVE & TRACTOR** Applied training on latest model automobiles and tractors. including engine overhaul. transmission and differentials. carburetion generator and ignition systems engine tune up. Hydramatic and Vacamatic Transmissions. and general service.

"There's Always a Demand for the Man who KNOWS!"

CHOOSE ONE OF THESE 5 LEADING TRADES

Get Out of that Rut.. Be a Skilled Tradesman! Have a Lifetime Career . Own Your Own Business and Be Secure in Your Old Age

NOW while Enrollment is still open. send for FREE information.

THE 5 DIVISIONS OF

NATIONAL TRADE SCHOOL

Dept. C 2610 Grand, Kansas City 8, Mo.

___● Plumbing ___● Drafting

___● Shoe Repairing ___● Electrical

___● Automotive & Tractor

NAME _____

ADDRESS _____

CITY _____ STATE _____

VETERAN OCCUPATION _____

Choose One of these 5 Essential Trades

Our complete courses of thorough training prepare you to go right into the field as a Qualified Tradesman at High Pay in only 34 weeks (39 in Shoe Repair). All courses under especially trained instructors with practical experience. 6 Hour Classes 5 Days a Week. Our Employment Department helps you.

VETERANS "Approved for veterans' training by the State Department of Education under Public Law 346." "Approved for veterans' training by the Veterans' Administration under Law 16."

Send Coupon for Free Information Now

NEW DIRECT MAIL PLAN SAVES YOU BIG MONEY!

DE LUXE QUALITY SCOTCH PLAID

Fibre AUTO SEAT COVERS

For Coupes and All Front Seats — Unbeatable Low Price $3.98 POST PAID

Sedans and Coaches COMPLETE SET Front and Back Seat $6.79 POST PAID

Slips on in a Jiffy! *Fits most Cars!*

Check These QUALITY Features

★ Colorful, Water Repellant Scotch Plaid Fibre
★ Rich Leatherette inserts at points of greatest strain
★ Elasticized slip-over sides for snug, smooth fit
★ Heavily stitched seams for extra long wear

RICHLY GRAINED LEATHERETTE TRIM

We challenge comparison because nowhere . . . but ***nowhere*** will you get these ***fine seat covers*** at our ***low price!*** Yes, thanks to our amazing ***direct-from-distributor-to-you*** plan, you can now own long-wearing DeLuxe Auto Seat Covers at ***half the price*** you'd expect to pay. And don't let our low price lead you to confuse our fine covers with inferior auto slip-covers being sold elsewhere. No indeed! These are top quality, ***DeLuxe*** Seat Covers master-tailored of rugged, ***water-repellent*** scotch-plaid fibre and ***richly grained leatherette.*** Their smooth fit and handsome appearance will vastly improve the looks of your car, make it easy for you to slide in and out, protect your clothing and upholstery, and check driving discomfort.

STYLE SA 4-door sedan with 1-pc. seats and backs.

STYLE SB 2-door sedan with split back, 1-pc. seat.

STYLE SC 2-door sedan with separate seats.

STYLE CA Coupe with 1-pc. back.

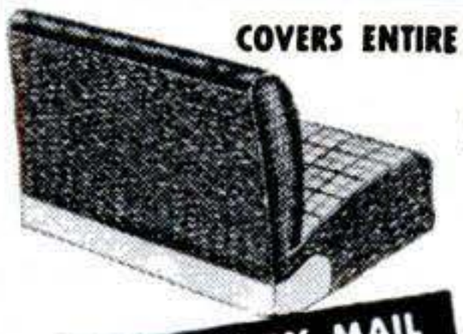
STYLE CC Coupe with 2-pc. back.

HOW TO ORDER SEAT COVERS

Referring to your license card, list the ***make, year,*** and ***model*** of your car. Also give model number, body type. Also state seat style of your car as shown in illustrations at left. Put all information in coupon below and MAIL TODAY!

Ask the Man Who Owns One! Over 50,000 Satisfied Users!

SPECIAL! FOR CAR OWNERS WHO APPRECIATE THE REALLY GOOD THINGS IN LIFE!



COVERS ENTIRE BACK OF FRONT SEAT

SOLD ONLY BY MAIL Order Direct and Save

SEND NO MONEY

Pay postman price of covers ordered plus postage or send cash and we pay postage. If not completely delighted return to us within 5 days for refund under our "you must be pleased—or your money-back" guarantee!

An out-of-this-world bargain in Super-Fit, Easy-To-Install

Custom Quality Seat Covers

★ Superb Materials ★ Skilled Craftsmanship
★ Luxurious Beauty ★ Long-Life Durability

Coupes and Front Seats $6.50 POST PAID

Sedans and Coaches Complete Set $9.95 POST PAID

Compare with $16.50 Seat Covers

AMERICAN MERCHANDISING CO., Dept. SC-127
9 Madison Ave., Montgomery 4, Ala. Price in Canada add 50c No C.O.D.'s

Please rush me the following Seat Covers checked below:

☐ ***DeLuxe Quality*** front seat $3.98 ☐ ***DeLuxe Quality*** complete set $6.79
☐ ***Custom Quality*** front seat 6.50 ☐ ***Custom Quality*** complete set 9.95

MAKE _____ YEAR _____ MODEL _____

Body Type _____ Seat Style ☐ Style SA ☐ Style SB ☐ Style SC ☐ Style CA ☐ Style CC

Check One ☐ I am enclosing $_____. ***Ship postpaid.***
☐ Ship C.O.D. I'll pay postman $_____ plus postage.

Name _____

Address _____

City _____ Zone _____ State _____

Copyrighted material

NOW AVAILABLE

Hundreds of Uses . . . This genuine Du Pont Nylon thread is practically unbreakable. What every hobbyist, sportsman, sailor, camper, wants. Used in model making, sail mending, tent repairing, bow and arrow winding, bamboo rod wrapping, kite flying and repairing, fly-tying, leather-craft, etc. Used by Air Force on parachutes because of its amazing strength and dependability. Here is your chance to get a giant spool of 4800 feet—almost a mile of Nylon thread—at the sensational low war surplus close-out price of only $1.49. Black or white. Order TODAY.

SEND NO MONEY, TEST AT OUR RISK

Just send your name and address. Specify white or black or two giant spools for only $2.89. On arrival, deposit only $1.49 per spool ($2.89 for two spools) plus C.O.D. postage on our guarantee if you are not delighted, you can return in 10 days and your money back. Cash with order, we pay postage. Only limited amount available. **Order Today.**

LEEWARD PRODUCTS
Dept. 48-H, 189 W. Madison St., Chicago 2, Ill.

Operate Your Own Business!

18 YEARS OF PROVEN SUCCESS

Clean and Mothproof Rugs and Upholstery

- **Nationally Advertised Services**
- **Big Profits**
- **Repeat Orders**
- **No Experience Needed**

If you are dependable, honest and willing to work, send today for details on how to become financially independent in a profitable, growing business of your own. Choose an open territory anywhere in United States, Canada, Mexico, or foreign countries. Services rendered in homes, offices, clubs or public buildings.

DURACLEAN cleans by absorption. No scrubbing! No soaking or shrinkage. This modern safe cleaning process uses mild solvents. Dirt, grease and many unsightly spots vanish as if by magic. Wool fibers come to life . . . matted pile rises . . . colors revive. Upholstery and floor coverings last longer.

DURAPROOF is another year 'round service. Not only kills moths and carpet beetles but makes materials resistant to both. Protects furnishings, clothing and auto interiors. Guards against mildew, too. DURAPROOF, to our knowledge, is the only moth proof service backed by a National MONEY BACK, 4 YEAR WARRANTY.

Leading furniture and department stores recommend DURACLEAN Dealer's service. Almost every building in your territory houses a potential customer needing one or both these Nationally Advertised services. Even auto dealers buy your service to revive upholstery in used cars.

Easy to learn. No shop needed. Operate from your own home. We furnish enough material to return your TOTAL investment. Gross profits up to $15 and $20 a day on EACH of your service men.

Start full or part time. Territories are limited! Write immediately for FREE Booklet explaining details. Easy terms.

Duraclean Co. 18-6 Ct. DEERFIELD, ILL.

WHY PAY MORE?

SEND THIS AD WITH ORDER

EVERY TIRE GUARANTEED
98% NON SKID, ORIGINAL TREAD
TRIPLE INSPECTED DEMONSTRATORS

Positively Not Re-caps!

600-16	$6.35	700-15	$7.15
650-15	5.35	700-16	7.65
650-16	6.95	750-16	9.65
600-20	$8.55	900-20	$17.55
650-20	9.55	1000-20	17.55
700-20	12.55	1100-20	17.55
750-20(8)	12.55	32x6(8)	12.55
750-20(10)	13.55	32x6(10)	14.55
825-20	17.55	34x7(10)	14.55

750-20 MILITARY 8 PLY $15.95
900-16 MILITARY 8 PLY $9.45

WRITE FOR PRICES ON OTHER SIZES
½ million tires shipped to satisfied customers. Trial will convince you. Mail Orders. Rushed on Receipt of Check or Money Order.

STANDARD TIRE
834 N. Broad St. Phila. 30, PA.

MAKE JEWELRY AND NOVELTIES AT HOME!

Work right on your kitchen table! No tools or experience needed. Learn earn within a week. Complete home instruction course, beautifully photographed, shows how to make 138 designs of pins, earrings, sprays, hair-do's, bracelets, candy dishes, jewel boxes, wall plaques, perfume bottles, novelties, etc. Shows over 100 kinds of Sea Shells and Plastics often used. Explains fully home methods of dyeing, pearlizing, golding, tinseling, frosting and luminous processes. Lists 200 kinds of raw materials with wholesale prices. Complete course only $1. Beginner's Kit, $3 (Foreign $4). Prepaid.

HOUSE OF GIFTS, Box 4550-RS, Coral Gables, Fla.

YOU CAN BE AN ELECTROPLATER

Be your own boss or work for big pay. Make money while you learn at home in spare time. Interesting, uncrowded field. Plate with chrome, nickel, silver, gold, etc. Money making trade secrets furnished. *Send postcard for **FREE** idea booklet today!*

HYDE SCHOOL OF ELECTROPLATING
432 F Street, Room 522, San Diego 1, California

COMBAT JUDO

Fiercest fighting technique known. Learn trick knock-outs, police tactics, and the art of Defense and Attack. Expert instructions in THREE volumes with 200 photographs and illustrations. Complete . . **only $2.25**

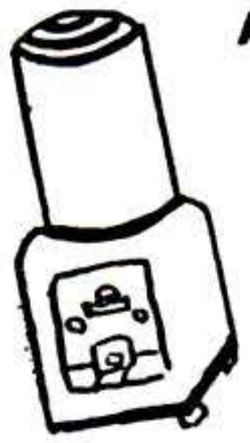
VARIETY HOUSE
Box 46-AC Wall St. Sta., New York 5, N. Y.

SHOE REPAIR OFFERS BIG INCOME

LEARN IN 12 WEEKS TIME

You can own your own shop or earn big income as skilled shoe repairman. Growing demand everywhere at top wages for men who know how. We teach you quickly by actually working on shoes and modern machines. Costs nothing under G.I. Bill of Rights. School open to all from 18 to 60 years of age. **Free Big 16 Page Book** explains everything. Send for your copy today.

MODERN SHOE REBUILDING SCHOOL
Established 1927
2937 Belmont Ave., Chicago, Ill. RUSH POSTCARD TODAY!
4577 Hollywood Blvd., Los Angeles 27, Calif.



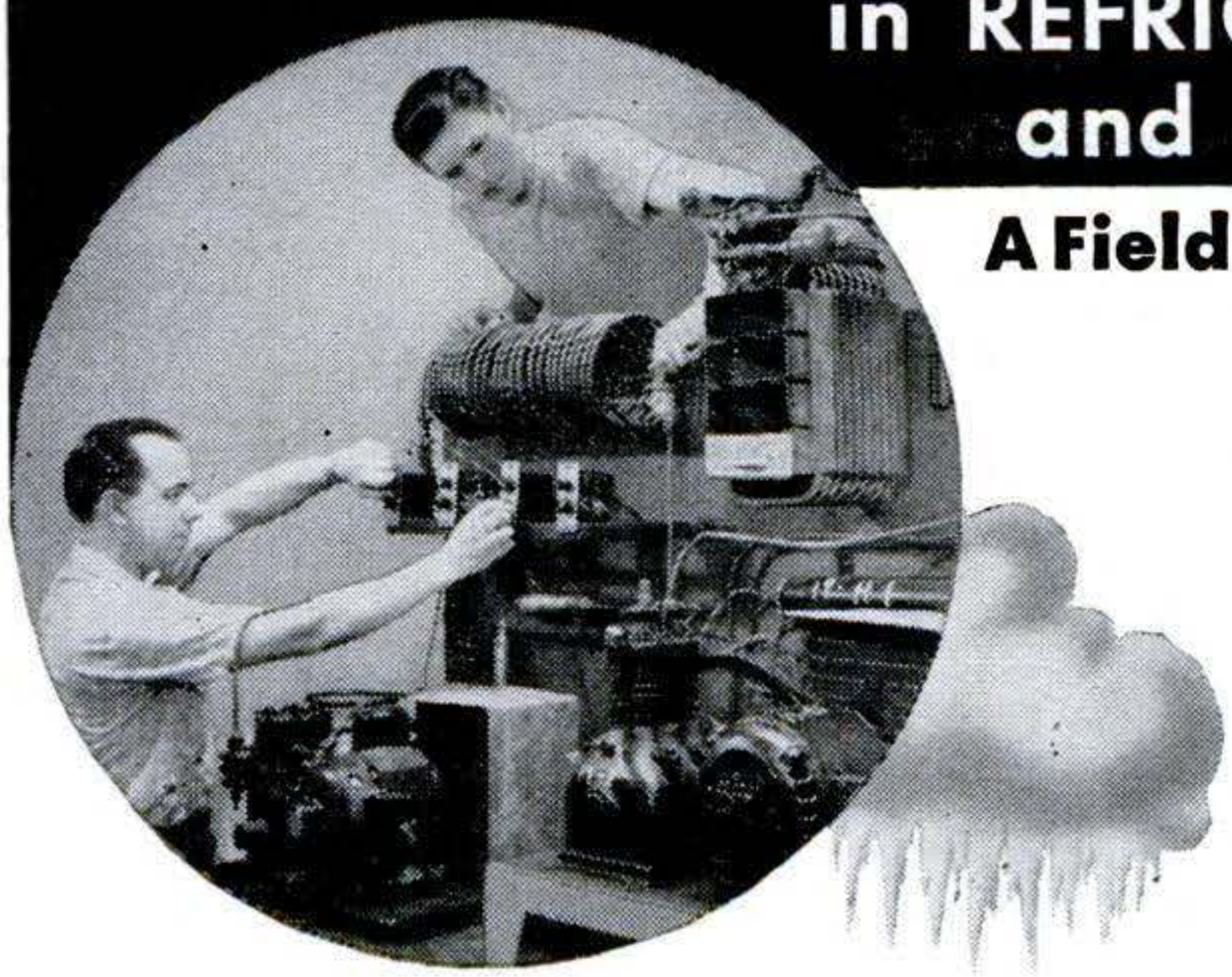
A PENNY POSTCARD MAY CHANGE YOUR FUTURE...

Get full information on the coin-operated vending machine industry. Start with a few machines and build a wonderful future. We'll give you complete advantage of our "know-how." Send for Free Booklet Today—**No Routes Sold!**

PIONEER VENDING SERVICE
ADDRESS ALL MAIL TO DEPT. PS
461 SACKMAN ST. • BROOKLYN 12, N. Y.

Copyrighted material

PRACTICAL TECHNICAL TRAINING FOR YOU in REFRIGERATION, HEATING and AIR CONDITIONING



A Field of Boundless OPPORTUNITIES

Trained Men are in great demand to meet urgent requirements for Refrigeration, Heating, Ventilating, Cooling, and Air Conditioning in domestic, commercial, industrial and processing fields of applications. Train now for a substantial career in industry — or a business of your own. Our practical technical courses fit you to become a Refrigeration Serviceman in 6 months; Refrigeration and Heating Serviceman in 12 months; Refrigeration, Heating, and Air Conditioning *Technician* in 2 years. Four terms per year—January, April, July, September. Start your training at beginning of any term. Write for free "PHOTO STORY" with 49 action photos of students fitting themselves for responsible positions — just as you can do!

SPECIALIZE
In 6 Months to 2 Years

MILWAUKEE SCHOOL of ENGINEERING
A Technical Institute · Founded 1903

Write for FREE PHOTO STORY

MILWAUKEE SCHOOL OF ENGINEERING
Dept. PS-648R, North Broadway, Milwaukee 1, Wis.
Without cost or obligation, send me your new 44-page "PHOTO STORY."
I'm interested in course on.....
Name.....Age.....
Address.....
City.....State.....

ELECTRICAL TRAINING

For Men of Ambition and Limited Time—Train for Successful Careers in Electricity

BLISS

Intensive 32 weeks residence course in fundamentals of *industrial electrical engineering*, including radio and electronics. Extensive laboratory practice in electrical measurements; testing power equipment: circuit tracing; wiring techniques; radio and industrial electronics; use of machine tools; motor construction; drafting. A basic training meeting industry's requirements for engineering aides, laboratory assistants; operating, production and maintenance technicians; customer engineers; draftsmen. Graduates hold responsible technical and executive positions.

Modern buildings, dormitories, dining hall, campus. Moderate cost. 54th year. Classes begin July 26; Nov. 22. For catalog write **7610 Takoma Ave., Washington 12, D. C.**

ELECTRICAL SCHOOL
A TECHNICAL INSTITUTE

WANT A GOVERNMENT JOB?

START AS HIGH AS $3,021

Many Permanent Appointments Being Made

VETERANS GET SPECIAL PREFERENCE

Many Government Jobs. City and Rural Carriers—Post-office Clerks—Storekeeper—Gaugers—Meat Inspectors—Accountants—Stenographers — Typists — etc. Prepare now for next Examinations.

FRANKLIN INSTITUTE,
Dept. C80, Rochester 4, N. Y.
(NOT GOVERNMENT CONTROLLED)

Sirs: Rush to me, without charge, copy of 40-page book, "How to Get a U. S. Government Job," list of positions, and full particulars telling how to qualify for them.

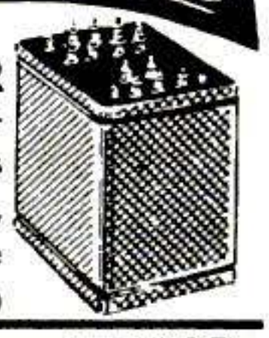
NAME.....

ADDRESS.....*VET?*.....

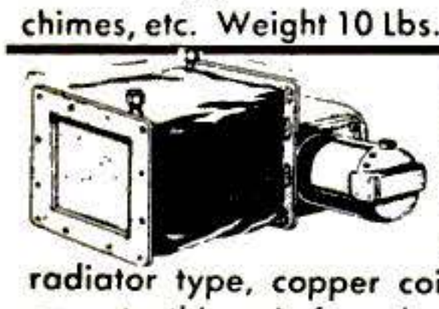
Copyrighted material

WAR SURPLUS AND OTHER BARGAINS

TRANSFORMER



Jefferson Electric step up or step down transformer. Input, primary 110-117 Volts A.C. Output, from 5 Volts to 650 Volts. Suitable for use with war surplus gadgets, heater relays, radio test filaments, electric trains, house chimes, etc. Weight 10 Lbs. New **$7.95** Each



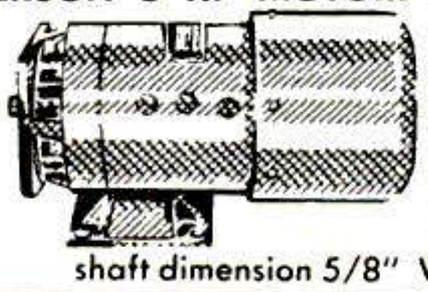
BLOWER COOLER or HEATER: For trailers, autos, offices, darkrooms, homes. DUMORE Motor, 1/6 cont. HP, Amperage 7.5, RPM 6400, 24 Volts. May also be used as dryer Simple installation, radiator type, copper coils. Transformer advertised in this ad will operate this unit from house current. Weight 13 Lbs. New, **$15.00**

SEND CHECK, MONEY ORDER or CASH

SCOOP! We have been awarded 100,000 genuine briar pipes by Quartermaster Corps. Assorted shapes and sizes. All popular makes. Set of 6, **$3.50**

MICROMETER Chrome plated, precision engineered and carefully tooled to give long life . . . all new. 0-1" capacity, **$2.25.** 1-2" capacity, **$3.50** Each.

EMERSON 3 HP MOTOR: AAF Type D50. This motor can also be used as generator when driven by another motor Ideal for portable welder, etc 28 Volts, D.C. Compound, 3800 RPM, 115 AMP, windings glass insulated, blower cooled, shaft dimension 5/8" Weight 27 Lbs New. **$13.95** each



CONDUIT WRENCH: Mfd. by JOAR. Jaws pass over conduit, pipe or tubing, slips down to snugly encircle fittings. Slight pressure tightens or loosens fittings. Will not mar or kink material. Set of 8. All new wrenches, Nos. 4-6-7-8-10-14-22-28, (Reg. cost $50.00), **$10.00** per set. Wght 4 Lbs.

25% DEPOSIT REQUIRED ON C.O.D. ORDERS

GOGGLES: Designed for paratroopers. Great for motorcycling, speed boating, hot-rod driving, etc. (One polarized and one clear) All new.....2 pair for **$1.00.**

4 in 1 SCREWDRIVER: 3 smaller sizes fit into 6" overall size. Fine steel bits. Solid brass handles. New. Ea **$1.**

CASTMASTER

ROD Made of tempered steel, supple action, 5' or 5½', heavily chrome plated. Cork pistol grip handle. Perfectly balanced. Full weight only 10½ ozs. Complete with heavy duty canvas carrying case **$9.85**

ALL PRICES F.O.B. CULVER CITY, CALIF.

LORD WELDON FLY REEL—Made of one of the strongest aluminum alloys. Weighs only 4½ ozs. Light, but sturdy. Thoroly ventilated for line drying. Balanced handle withstands terrific pull. Single action. Hauls 50 yard line packed. Individually boxed. Each.... **$2.25**

SHIP'S BELL: U. S. Navy Surplus. Solid Brass with smooth polished finish. 5" Diameter Great for Patios, Doorways, in Dens, Ranches, etc. Matching solid brass wall bracket included. Weight 3¼ Lbs. All New **$5.95** Each.

FISHING AND HUNTING KNIFE Hollow ground 6" blade of bright finish, high quality, tempered steel. Non-slip cowhide handle, with hand finished metal guard and butt. Stitched and riveted genuine leather shield. It's a knife you'll be proud of! All New . **$1.50** Each.

CLIPS: Adel Aluminum Co., Rubber lined, hundreds of uses in any shop. Assorted sizes, all new. . . . 5 Doz. **$1.** — 500 **$5.**

AIRBORNE SALES CO., INC. DEPT PSM 6-8 CULVER CITY, CALIF.

MAKE BIG MONEY IN JEWELRY REPAIR AND DESIGN

Step into this easy to learn, uncrowded field through our unique home study course. Big demand for trained men and women. Interesting, pleasant, clean work. Any one can learn. We guide you step by step. No interference with present job. Opportunity to get in business for yourself. Covers entire field of jewelry repair and design. Complete set of more than 100 professional tools and free diamond included in 20 lesson course.
Send today for full information. No obligation.

ILLINOIS SCHOOL OF WATCH REPAIRING
2870 Elston Ave. Dept. J-1 Chicago 18, Ill.

"YOU ARE UNDER ARREST!"

Help Bring Crooks to Justice Through Scientific
CRIME DETECTION!
We have taught thousands this exciting, profitable, pleasant profession. Let us teach you **in your own home.** Learn Finger Printing, Firearms Identification, Police Photography, Secret Service Methods thoroughly, quickly, at small cost. Over 800 of all American Bureaus of Identification employ I. A. S. students or graduates. We can prepare you for this fascinating work during spare time. Write today, **stating age,** for "Blue Book of Crime."
INSTITUTE OF APPLIED SCIENCE, 1920 Sunnyside Ave., Dept. 136-A, Chicago 40, Ill.

LAW STUDY AT HOME for Personal Success and LARGER EARNINGS. 39 years expert instruction—over 114,000 students enrolled. LL.B. Degree awarded. All text material furnished. Easy payment plan. Send for FREE BOOK NOW—"Law and Executive Guidance."
AMERICAN EXTENSION SCHOOL OF LAW
Dept. 90-PS 646 N. Michigan Ave. Chicago 11, Ill.

TRI-STATE COLLEGE

B.S. Degree in 27 months in Engineering (7 branches), Bus. Admin., Acctg. and Sec. Science. Graduates successful. **65th year.** Enter Sept., Jan., March, June. Write for catalog. **568 College Ave., Angola, Ind.**

HYPNOTIZE Learn modern speed hypnotism. Self-hypnosis. Secrets revealed. Exciting experiments. Overcome inferiority complexes, smoking, alcoholism, stuttering, nailbiting, phobias, insomnia, stagefright. Improve your memory. Private & class instruction available at Institute. Complete practical homestudy course....$2
Hypnotism record album for mass-hypnosis & self-hypnosis.....$5
POWERS INSTITUTE OF HYPNOTISM, 1324 Wilshire Blvd., Dept. 34, Los Angeles 14, Calif

RADIO **ENGINEERING** Television, FM, Broadcasting, Servicing, Electronics, Aviation, Marine & Police Radio taught thoroughly. 72 weeks' Engineering course equivalent to 3 years' college radio work. Approved Veteran Training. Catalog upon request.
Valparaiso Technical Institute, Dept. 503, Valparaiso, Ind.

DEVELOP RUGGED STRENGTH!

Strong Men's Club of America offers FREE Membership!
Send for your personal membership card and Strength Secrets. No dues! No obligations! Many valuable privileges! Send name, address, age, on penny postcard.
JOE BONOMO Director, (Dept. PS-6) **Strong Men's Club of America** 1841 Broadway, N. Y. 23, N. Y.

TRIM YOUR OWN

TRIM HAIR AT HOME—SAVE BARBER BILLS
Trims hair as it combs! Easy! Quick! Keeps men's, women's, children's hair trim, neat, freshly-cut looking all the time! Trims, tapers, thins out uneven hair. Use like ordinary comb. Safe. Simple. No experience required. Fine for legs, underarms! *Sells Like Wild!*
SAMPLES for AGENTS
Sample offer sent immediately to all who send name at once. Penny postal will do. SEND NO MONEY. *Just your name.* **KRISTEE CO.**
702 BAR ST., AKRON, OHIO

Learn BUILDING

AT HOME • All Blue Print Building Plans, Specifications, Lessons Furnished

Earn more money as a building tradesman. Prepare for advancement and increased pay as a building foreman, superintendent, inspector, estimator, material buyer or salesman. Train to be a building contractor, have your own money-making business in this busy, prosperous building field.

More than 19 million new homes needed in U.S., say experts. New building now at rate of one million homes a year, plus 200,000 commercial buildings, plus expanding farm building construction.

Mail coupon today. FREE book tells how you learn Building Construction—How to Read Blue Prints, and Estimate Building Costs—at home in your spare time. Learn modern construction methods and materials, how to lay out work and direct all building operations. This is the training needed for rapid advancement to higher-paid jobs, or your own successful building business.

FIND OUT ABOUT TRAINING AND OPPORTUNITIES FOR YOU IN BUILDING

Established in 1904, Chicago Technical College offers you thorough, practical training in Building, by home-study. Mail coupon for free information. See what this Course has done for others, what it can do for you. Read what Chicago Tech graduates say about their work, earnings, success. Learn the rewards awaiting you as a trained builder—and how quickly, easily you can get started. Simply MAIL COUPON TODAY in an envelope or paste on a penny postcard.

MAIL COUPON NOW

CHICAGO TECHNICAL COLLEGE
G-158 Tech Bldg., 2000 S. Michigan Ave., Chicago 16, Illinois

Mail me FREE building Lesson with information about big opportunities in BUILDING and how I can train at home.

Name.....Age.....

Address.....

City.....Zone.....State.....

CHICAGO TECHNICAL COLLEGE
G-158, Tech Building, 2000 South Michigan Ave.
Chicago 16, Illinois

Learn A Trade NOW!

PRACTICAL SHOP TRAINING!

In Our Chicago Shops

TRADES THAT PAY

LEARN BY DOING

- Auto Mechanics
- Machinist
- Diesel Engines
- Welding, Gas & Arc
- Refrigeration
- Piano Tuning

Above approved for G.I.'s & Civilians

- Body & Fender Repair

ESTABLISHED 1902

VISITORS WELCOME

—CALL IN PERSON OR MAIL THIS AD TO—

GREER SHOP TRAINING

(Dept. PS-368) 460 South State St., Chicago 5, Ill.

Please send without obligation free information regarding trade checked above. (Specify whether you are a Veteran ☐ or Civilian ☐)

Name.....Age.....

Address.....

City.....State.....

Keep that Car "TICKING"

Every operator and mechanic needs AUDELS AUTO GUIDE.

This book saves time, money and worry. Highly endorsed. It presents the whole subject of auto mechanics:

1—Basic principles
2—Construction
3—Operation
4—Service
5—Repair

Handy Size. Easily understood.

NEW FLUID DRIVE, HYDRAULIC SHIFT AND DIESEL ENGINES FULLY COVERED

Over 1500 pages—1540 illustrations showing inside views of modern cars, trucks and buses with instructions for all service jobs.

$4 COMPLETE • **PAY ONLY $1. A MONTH** ←

ASK TO SEE IT!—To Get This Assistance for Yourself Simply Fill in and Mail Coupon Today.

AUDEL, Publishers, 49 West 23rd St., New York

MAIL AUDELS NEW AUTO GUIDE for free examination. If O.K. I will send you $1 in 7 days; then remit $1 monthly until price of $4 is paid. Otherwise I will return it.

Name.....

Address.....

Occupation.....

Employed by..... P. S. M.

Copyrighted material

FALSE TEETH FIT TIGHT FOR LIFE OF PLATE

With One Application or YOUR MONEY BACK

Professionally Developed AMAZING

LINO-DENT

REAL COMFORT INSTANTLY FOR ALL PLATE WEARERS

At last — with no fuss or bother—looseness and slipping vanish—gum soreness heals and disappears—forever.

NOT MESSY • NOT STICKY

Not a paste—not a powder—Lino-Dent is an amazing development in the field of plastics. It is the same material modern dentures are made of. That's why we can guarantee *perfect plate comfort* not for just a month but *permanently* with *one application.*

ABSOLUTELY SAFE

Lino-Dent is pure, non-toxic, non-irritating, harmless, odorless, tasteless, pleasant, simple to use. Needs no heat.

EASY AS A B C TO USE

A. Apply to Plate.
B. Insert in Mouth.
C. Bite for Perfect Fit.

It's professionally developed

YOUR MONEY BACK IF NOT COMPLETELY SATISFIED

We guarantee perfect plate comfort permanently with only one application.

SEND NO MONEY Full size package only $1 plus postage. Specify upper or lower. Or send $1 and we will pay postage.

LINO-DENT, Inc. 1199 Broadway New York 1, N. Y.

LINO-DENT, Inc. Dept. A3
1199 Broadway New York 1, N. Y.
Send LINO-DENT for:
☐ Upper ☐ Lower $1 ☐ Both – $2
I will pay postman ☐ $1 . . . ☐ $2 plus postage. My money will be cheerfully refunded if I am not satisfied.
NAME.....
ADDRESS.....
CITY..... STATE.....
Enclose payment and you save postage!

Don't be disappointed. Get the best for your money. Famous Banner Fireworks have all the ZIP, BOOM, BANG you expect of fireworks. This year several new creations have been added. You'll thrill to every last piece in this **Big Bargain Assortment.**

BIG SPECIAL DEAL—ONLY $4.95

Retail value $11.25. Buzz Bombs—Star shells Block Busters—Zig-Zag Whistles—Flashlight Crackers—Sky Rockets—Roman Candles—Repeating Aerial Bombs, Sparklers and many others. Over 500 pieces in all. Rush order today. Supply limited. Send money order, bank draft or currency. No C. O. D's. Catalog FREE.

BANNER FIREWORKS MFG. CO., INC., DEPT. 147
446 Capistrano Toledo 12, Ohio

Woo-Wee *wolf whistle* AUTO HORN

Reproduces "Wolf Whistle" better than any sailor. Screeches, barks, whistles, imitates siren, moves any "road hog" off the highway in "double quick plus." Attract more attention than by driving a yellow Cadillac. Operates from manifold. Installed on any car in 15 minutes. Sturdily constructed. Cleverest novelty since the use of the auto. Be the first user in your neighborhood. Dealers wanted. 6 dollars each. Order today. Ohio orders add 3% tax. C.O.D. orders accepted.

THE PROTECTUROD COMPANY—Dept. 102
4033 Windsor Road • Youngstown 7, Ohio

$1500 FOR 1¢

Many valuable coins may be slipping through your fingers. Here are some possible values: **1926 S. Buffalo Head Nickel $35.00; 1894 S Dime $200.00; 1827 Quarter $1000.00; 1938 O Half Dollar $2000.00. We publish a Coin Encyclopedia which lists hundreds of premiums paid for coins. We do not purchase coins. The values listed in our coin encyclopedia have been compiled from the foremost Coin Dealers.**

SEND $1.00 FOR YOUR COPY OF THE STANDARD COIN ENCYCLOPEDIA TO BLUE BIRD BOOKS, Inc. Dept. BA, 373 B'way, N. Y. 13, N. Y.

DRAW for MONEY

BE AN ARTIST!

Trained Artists Are Capable of Earning $60-$75 and more A WEEK

Use Your Spare Time to Prepare for a Profitable Art Career!

It's pleasant and interesting to study Art the W.S.A. way. **COMMERCIAL ART, DESIGNING and CARTOONING**—all in ONE complete home study course. No previous Art experience necessary—we teach you step by step—hundreds have profited by our practical method. TWO ART OUTFITS FURNISHED. Colorful FREE BOOK. "Art for Pleasure & Profit" - tells all about our course, service, what our graduates say—and commercial opportunities for you in Art.

FREE BOOK gives details!

WASHINGTON SCHOOL OF ART
Studio 136M, 1115 15th St., N.W., Wash. 5, D. C.

Send your free book and full particulars. **Veterans: Course G.I. Approved.**

Name.....Age.....
Street.....
City.....Zone (.....) State.....
☐ I am entitled to training under the G.I. Bill

Fit-Rite makes False Teeth TIGHT

Makes loose dental plates fit snugly and comfortably.

LASTS for MONTHS!

Simply squeeze on dental plate and put it in your mouth. Hardens and becomes part of plate. Money-back guarantee.

FREE Generous package of Dental Plate Cleanser with each order. Send $1.00 or mailed parcel post collect.

Fit-Rite Co., 1573 Milwaukee Ave.
Dept. 6-42 Chicago, Ill.

Make your STOP LIGHT SHOUT!

AMAZING STOP LIGHT FLASHER!

Make Your Stop Light Flash 115 Times Per Min.

A SENSATION! Automatic. Instant acting when foot brake applied. Attracts attention. Warns car behind. Non-Rusting. Dust, Oil, Vapor & Waterproof. Used by police & fire depts. Attach in 5 min. Approved by leading safety engineers.

FREE WITH ORDER. "HOW TO SAVE MONEY ON CAR 'Motoring Hints' BOOKLET". ACT NOW! If dealer can't supply send **$3.00** cash or M.O. We pay postage.

"STOP-IT" makes stop light flash 115 times per min.

MACCHI & CO.
927 Larkin St., Dept. SJ, San Francisco, Calif.

Copyrighted material

STUDY AT HOME

With An Educational Institution

Men with specialized training win higher positions, insure larger earnings, and are bigger successes in business and public life. Opportunities NOW greater than ever before. Send for our Catalog.

ARTS and SCIENCES

Courses in Philosophy; Education; Letters; Public Health; Medical Jurisprudence; Psychology; Sociology; Physics; Chemistry; Plastics; Geology; Political Science; Theology; Business and Commerce; Accounting; Mathematics; Statistics; Agriculture.

ENGINEERING

Courses in Electrical, Civil, Mechanical, Drafting, Architectural, Steam, Aeronautical, Radio, Structural, Mining, Industrial, Petroleum, Marine, Chemical, Diesel, Automobile, Refrigeration, and Air Conditioning Engineering.

LAW

Complete Professional Law Course includes 18 Hornbrook Series college grade textbooks. Courses also in Commercial Law, Patent Law and Medical Jurisprudence.

McKinley-Roosevelt Incorporated, 4610-AB, Sheridan Rd. Chicago 40, Ill.

AVIATION TRAINING

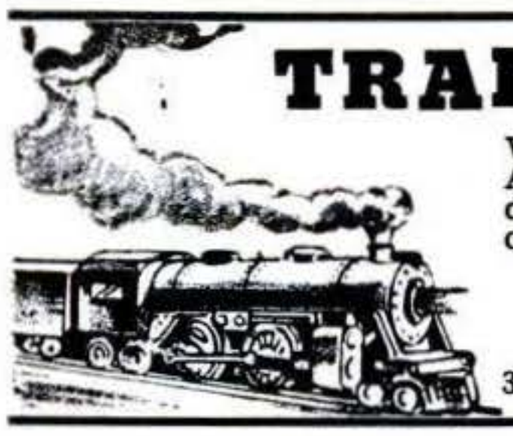
AERONAUTICAL ENGINEERING
AIRCRAFT and ENGINE MECHANICS (A & E)

Train on famous Northrop Field—New classes starting soon.
Write for illustrated catalog.

Northrop Aeronautical Institute

1525 E. BROADWAY HAWTHORNE — *Division of Northrop Aircraft, Inc.* — LOS ANGELES COUNTY CALIFORNIA

APPROVED FOR VETERANS



TRAIN REPAIRS

We specialize in toy train repairs. Any make or model, foreign or domestic. Mail or express orders cared for promptly.

SPOONLEY
"The Train Man"
37 Choate Ave., Buffalo 20, N. Y.

RESORT OPERATION AND MANAGEMENT

Your Profit Opportunity is today's growing demand for more Outdoor Life and Recreation. Ride this opportunity by establishing your own Resort. Book "tells how" based on years of experience. Covers many problems, management, operation, planning, etc. One hundred pages. $2.00 copy postpaid.

WOODBECK PUBLISHING Co.
WINCHESTER BLDG. GRAND RAPIDS, MICH.

A PROFITABLE TRADE! AN EXCITING HOBBY!

Learn... PHOTO NEGATIVE RETOUCHING

$21.50

Increase your income . . . Improve the quality of your own photography. New 5-week home study course—1 lesson each week—will teach you how. Complete course and all necessary equipment only $21.50. For FREE brochure and complete details write today!

MARSHALL PHOTOGRAPHERS, Inc., School Division
162 N. State St. Dept. PS-6 Chicago 1, Ill.

Woodworth INDICATOR CALIPERS

A spring actuated indicator hand enclosed in one of the hollow legs has a pointer which comes to the outside through a slot and moves across the indicator marks giving about 20 to 1 multiplication of the movement at the contacting end of the hand.

Bright stainless steel throughout. 4 inch size, either inside or outside. **$2.75** each postpaid

Distributors wanted

WOODWORTH SPECIALTIES CORP.
Binghamton New York

HOW TO *Fight! Wrestle! Jiu-Jitsu!*

FREE

Plus Weight Lifting! Strong Man Stunts!

Be prepared to protect your family, friends, yourself in any emergency! Be admired! George F. Jowett, Champion of Champions, gives you free his "SMASHING CHAMPION SECRETS." Contains many "HOW-TO-DO-IT" pictures that quickly and simply show you how to powerfully deliver a knockout, how to break any hold, how to overpower any opponent plus weight lifting and strong man stunts! Inside professional "Tricks of the Trade" proved successful by police, armed forces, fighters, wrestlers, etc.! Free for a limited time with this sensational offer!

YOU NEED HE MAN FITNESS TO HANDLE ANY TOUGH SITUATION!

NOW! All 5 Famous JOWETT COURSES in 1 Complete Muscle Building Volume! 25c

LET ME PROVE I CAN MAKE YOU—

COMMANDO-TOUGH

OR IT WON'T COST YOU A CENT!

says *George F. Jowett* WORLD'S GREATEST BODY BUILDER

Give Me 10 Minutes A Day
Learn My Time Tested Secrets of Strength

I'll teach you the "Progressive Power Method" that rebuilt me from a physical wreck condemned to die at 15, to the holder of more strength records than any other living athlete or teacher! Has proven it builds the strongest, handsomest men in the world. Let me prove on a money back basis—that no matter how flabby or puny you are that I can add inches to your arms, broaden your shoulders, give you a man-sized chest, powerful legs and a rock-like back—in fact power pack your whole body so quickly it will amaze you—right in your own home! I'll bring to life new power in you inside and out, until YOU are satisfied you are the man you want to be.

PROVE IT TO YOURSELF IN ONE NIGHT

Send only 25c for my 5 easy-to-follow, picture-packed courses now in 1 complete volume "How to Become a Muscular He-Man." Try it for one night! Experience the thrilling strength that surges through your muscles.

10 DAY TRIAL!

Think of it—all five of these famous courses now in one picture-packed volume for only 25c. If you're not delighted with this famous muscle-building guide — if you don't actually FEEL results within ONE WEEK, send it back and your money will be promptly refunded!

PHOTO BOOK OF FAMOUS STRONG MEN!

I am making a drive for thousands of new friends fast—REGARDLESS OF COST!

SO GET NOW MY 5 Muscle Building COURSES
(Valued at $5 each)

All in 1 Great Complete Volume
Packed With How-To-Do-It Pictures!

Now, this "get-acquainted," extremely low price of only 25c is your chance to build a body you'll be proud of! Follow Jowett's easy method of muscle building NOW!

For Only 25c

FREE!

Photos that inspire you to might and muscle. Free with order.

2 FREE GIFTS!

George F. Jowett
Champion of Champions

Jowett Institute of Physical Culture Dept. PS-86
230 Fifth Avenue, New York 1, N. Y.

George F. Jowett:—Please send by return mail, postpaid, FREE "Smashing Champion Secrets" and FREE Jowett's Photo Book of Strong Men, along with all 5 Muscle Building Courses. **1.** Molding a Mighty Chest. **2.** Molding a Mighty Arm. **3.** Molding a Mighty Grip. **4.** Molding a Mighty Back. **5.** Molding Mighty Legs—Now all in One Volume "How to Become a Muscular He-Man." Enclosed find 25c. NO C.O.D.'S.

NAME..... AGE....
(Please Print Plainly, Include Zone Number)

ADDRESS.....

Copyrighted material

THE GREATEST THING IN PLASTICS!

PLASTICAST

PLASTICAST is a liquid plastic; can be poured into ANY kind of mold or container. Hardens in a few minutes into a transparent solid, clear-as-glass, tough-as-steel plastic! *As easy to use as pouring water out of a glass!* No tools or machinery required. Ideal for imbedding flowers, butterflies, photos, souvenirs, and for making beautifully brilliant jewelry, gems, displays, fishing lures, magnifiers, lenses, knick-knacks and novelties. Easily cast into sheets, rods or blocks. ANY shape, ANY color. **EVERYTHING FURNISHED** including molds for making **PENDANT HEARTS, ENCHANTED GARDENS, MAGNIFYING GLASSES,** etc., sufficient materials included for making about $100.00 worth of novelties! For FUN or PROFIT, start TODAY. C.O.D. orders accepted with $1.00 deposit. Postpaid U.S.A. & Canada only. The ONLY outfit on the market containing molds!

COMPLETE MASTER OUTFIT—$3.50

FREE SPECIAL OFFER

A very attractive and useful novelty made with one of our plastics given absolutely free with every one of our catalogs! Catalog lists hundreds of new materials for making **MOLDS** and **CASTINGS** with Liquid Plastics, Liquid Ivory, Liquid Marble, Wax, Latex, Metal, Castwood, etc. Big selection of rubber molds. Price of catalog only 10c coin or stamps.

PLASTICAST CO. (Dept. A)

5961 Madison St. Chicago 44, Illinois — *We have no retail store—order by mail only.* — P. O. Box 987 Palo Alto, Calif.

SAVE $5 *Genuine Quality* **GABARDINE** Dress Trousers

$11.95 VALUE! Order by mail and SAVE! Firmly woven virgin wool and fine-spun rayon. Twill weave resists wrinkles. Holds crease, gives amazing wear. Expert fashion tailored for perfect fit. Zipper front. Roomy pockets, bar-tacked for double strength. Blue, Tan, Sand, Lt. Brown, Dk. Brown, Blue-Gray. WAIST SIZES: 28-36 pleated—38-44 plain.

Only **$6.95 PR.**

SEND NO MONEY Send name, waist size, color. Pay postman only $6.95 plus C.O.D. Or, send money and save C.O.D. Money-Back Guarantee!

LINCOLN TAILORS Dept. PS-6 Lincoln, Nebr.

MAKE UP TO $5.00 AN HOUR In Your Own YEAR 'ROUND Business!

ONLY A FEW DOLLARS PUTS YOU IN BUSINESS!

Many Clearing as High as $20 to $30 a Day *NET* Renewing Rugs, Carpets, Upholstery. New Method Now Used for Auto Upholstery. Write for Facts About Quick, Easy Way to Get Started

Here is the chance you've been looking for to step into a pleasant, dignified, big-pay business of your own that offers you a steady, year 'round income. Start on "a shoestring," full or spare time, right from your own home. Equal opportunities for men and women, young or old, in small towns or big cities. **No experience needed.** Many making big money with new Americlean System just cleaning auto upholstery. **Easy to learn.** We send you complete instructions and quick-cleaning supplies so you can start making money the very first day! Quick method cleans upholstery, rugs and carpets like new without taking off floor! Tremendous demand in homes, apartments, hotels, stores, office and public buildings. **Steady repeat** business. Territories going fast. Write today for full FREE facts. No cost or obligation. Rush letter or postcard now to

AMERICLEAN CO., Inc.
Dept. H-18, 211 North 7 St., St. Louis 1, Mo.

WRITE FOR FREE DETAILS NOW!

Made to U. S. Army Specifications!

16-JEWEL

ELGIN

$19.95

Sturdy 16-Jewel ELGIN men's wrist watches. Water repellent. Sweep second hand. Stainless Steel back. Unbreakable crystal. QUALITY! American made. Fully reconditioned with ONE YEAR GUARANTEE! Made for the U. S. Army Air Corps. **They HAD to be good. SEND NO MONEY.** Simply pay postman $19.95 plus 10% tax and postage on delivery. Cash orders sent postpaid. Limited supply. **UNITED PRODUCTS CO.,** 7941 S. Halsted St., Dept. RES-720, Chicago 20, Ill.

LAW FREE BOOK

Write today for FREE 48-page book, **"THE LAW-TRAINED MAN,"** which shows how to learn law easily in spare time at home through the Blackstone course prepared by 60 well-known law authorities. We furnish all material including 18-volume Modern American Law library. Many successful attorneys among our graduates. LL.B. degree. Moderate cost; easy terms; Money-Back Agreement.

BLACKSTONE COLLEGE OF LAW
225 N. Michigan Ave., Dept. 120-A, Chicago 1, Ill.
A Correspondence Institution Founded in 1890

MAGNETS

OF ALL TYPES—10c UP
AMAZINGLY POWERFUL!!

4 oz. Alnico Magnet, lifts 10 lbs. $1.00. Our Leader, 15 oz. Magnet, lifts 40 lbs. $1.95. New alloy—will not weaken! Useful for lifting valuables from tanks, lakes, or rivers easily! 7 small magnets $1.00 with list of many shop and home uses. Satisfaction guaranteed.

R. L. EYRICH, 2566 N. 49TH ST., MILWAUKEE 10, WIS.

TENTS

Small & large, new & used. Army surplus. Also canvas covers, hammocks, canvas cots, clothing, paints. Lowest prices. Free circular.

MORSAN SALES
10-15P 50th Ave. Long Island City 1, N. Y.

RELEASE the Full Power of YOUR MIND

Send for free booklet telling how you can achieve success and reach your personal goals. Find out how to remove frustrations and inferior feelings. Learn how to make your subconscious mind work *for*, not against, you. Write today. No obligation.

Broadwell Studio Schools, Dept. 8F — **Covina, California**
Established 22 Years

EYE-GLASSES *by MAIL*

Send No Money!

NEW LOW PRICES

16-Day Trial Offer
NEWEST STYLES

FREE Scientific Sight Test Chart and Catalog. Write today.

U.S. EYE-GLASSES CO. 1557 MILWAUKEE AVENUE Dept. 6-42, CHICAGO, ILL.

New Scientific "GUZZLIN CHARLIE"

MYSTERY DRINKING BIRD WITH ROLY POLY EYES

$1.95 Complete with stand. No springs, no gadgets, no wires, not mechanical. Amazing "Guzzlin Charlie" drinks and drinks; he is always thirsty. You won't believe your eyes. Young and old go wild over him. **SEND NO MONEY.** Just send your name and address, pay postman $1.95 upon delivery, plus delivery charges or remit $1.98 and we pay postage. Rush your order today. Special prices to dealers.

BERNARD FINE CO., INC.
501 Sixth Ave., Dept. PS13, New York 11, New York

Copyrighted material

LEARN EXPORT

Buy and sell world-wide without capital. Travel abroad if desired. Export men and women in demand. Your own business — **profits unlimited.** Salaried jobs — up to more than $10,000 a year. Practical, low cost WORLD TRADE COURSE teaches you quickly at home in spare time. No previous special experience or schooling needed. World Trade Certificate awarded. Write today for FREE DETAILS. No obligation. Please state age. Airmail reaches us overnight. **THE MELLINGER CO., Exporters-Importers, 1422-W Westwood, Los Angeles 24, Calif.**

REFRIGERATION and AIR CONDITIONING

REFRIGERATION TRAINING Since 1927

MECHANICAL units everywhere need servicing. Soon new units will require installation service. You can be ready with reliable pay-knowledge of this big income field. Unique home study-plus actual practice plan prepares you to enter servicing or installing field or get into business of your own. Great opportunities now and later. Get facts FREE. Write today!

UTILITIES ENGINEERING INSTITUTE
2525 Sheffield Ave., Dept. 368, Chicago 14, Ill.

MAKE HOLLYWOOD STYLE CEMENT POTTERY, birdbaths, benches, coffee tables, stucco-rock, rustic garden walks, etc. Many more. Color concrete with chemicals. Start with small capital. 10c brings sample, pictures, details.

HOLLYWOOD CEMENTCRAFT
8527-B Wonderland Ave. Hollywood 46, Calif.

When Writing Advertisers Please Mention Popular Science

CARTOONING

Learn cartooning, drawing, sketching, etc. 46 lessons, 617 illustrations, including drawing paper, pens, pencils. $1.00 complete. Order today!

American Stamp Co., Dept. C-4113, Wilmington 99, Del.

REFRIGERATION

AIR CONDITIONING—Trained men paid well to service, install, maintain, repair, rebuild household and commercial refrigerators. Opportunity for full time, spare time earnings. Train at home or in our big shops. Approved for Veterans. (Non-Veterans inquire about our Low Payment Plan and Pay After Graduation Plan.) Send for FREE BOOKLET and FULL information. No obligation.

COMMERCIAL TRADES INSTITUTE, Dept. A1-6
1400 W. Greenleaf Chicago 26, Illinois

Original
HOLLYWOOD WOLF WHISTLE

CAR HORN

You, too, can become a Hollywood Wolf. Give the wolf call and make other weird noises with the original HOLLYWOOD WOLF WHISTLE on your car Precision made. Works off the intake manifold. Easily installed in 15 minutes. Works in trucks, motorcycles, motor boats, outboard motors, too. Guaranteed. If your dealer cannot yet supply you, order direct, giving us your dealer's name. No COD's or stamps. No individual foreign orders. AUTOMOTIVE DEALERS & JOBBERS write for information on this fast selling, proved item.

DESCRIPTIVE LITERATURE ON REQUEST

YODER MFG. COMPANY
2403-41 East 103rd St., Los Angeles 2, California

MEN!

DON'T STAY FAT

You CAN **LOSE**

UP TO **7** POUNDS

IN ONE WEEK

SAFELY!

WITHOUT RISKING HEALTH

NO DRUGS
STARVATION
EXERCISE
MASSAGE
NOTHING TO WEAR

PROTAM PLAN Good for Ladies Too!

LOSE UGLY FAT NOW . . . Notice the difference in POUNDS and INCHES the very first week, whether Overweight 10 or 100 Pounds . . . even if burdened with Fat for many years (illness excepted). The Protam Plan controls weight . . . once down to normal, it helps retain your new "athlete's waistline" as long as you like . . . NOT A TEMPORARY LOSS. Protam is not a Drug, Laxative or Thyroid . . . absolutely Harmless . . . Is Good For You.

OXIDIZES EXCESS FAT

Thousands of Overweight people report sensational results, some Losing 30 Pounds in 40 Days, others enthuse about "How Well They Feel" while Reducing. To achieve same results . . . Just take Protam as directed, Once or Twice a day, according to how fast you wish to Lose Weight. Protam is a FOOD, Scientifically Formulated, Laboratory Tested and Approved, Fortified with energy-giving PROTEINS, AMINO ACIDS, MINERALS and VITAMINS. The Protam Plan reacts quickly . . . Drastically Cuts Down Fat Producing Calories. USES UP ACCUMULATED EXCESS FAT. Lose Ugly Fat Economically, Simply, Pleasantly, without risking your health. Look and feel better, see bulges disappear within the first weeks.

REDUCE WITHIN 10 DAYS OR MONEY REFUNDED

10 DAY FREE TRIAL OFFER

ORDER TODAY . . . You risk NO MONEY, not even postage. You must Lose Pounds and Inches within Ten Days or your Money will be Refunded Immediately, including postage. Your decision is final. Just Mail Coupon Today . . . NOW. On delivery simply pay postman $2.50 . . . begin Losing Fat the first few days. Enjoy New Energy . . . Have confidence in your appearance.

SEND NO MONEY

Associated Nutrition Products, Inc., Dept. 7906
150 Nassau St., New York 7, N. Y.

Send me in plain package the 8 oz. Protam Plan for a Ten Day Free Trial. I will pay postman $2.50 plus postage. This money will be refunded immediately, including postage, if I do not safely REDUCE to my satisfaction within 10 Days. I RISK NOTHING.

Name .....
Print Plainly

Address .....

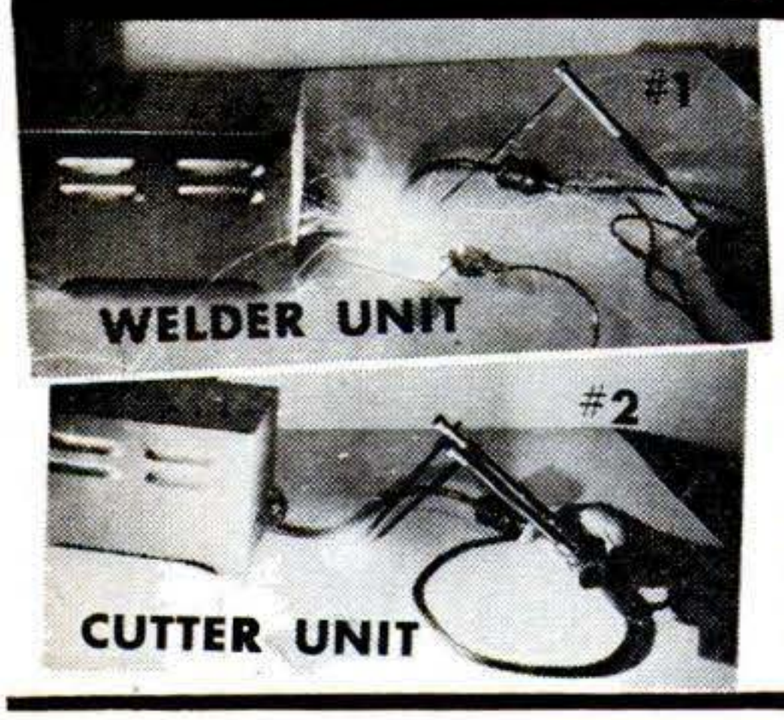
City, Zone, State .....

Sorry, No Canadian Orders.
We Pay Postage if Check or Money Order Enclosed.

Copyrighted material

Sensational New Electric ① WELDER ② CUTTER!

BOTH only $12 LOWEST PRICE IN HISTORY!



Uses 110-115 AC or DC • INSTRUCTIONS INCLUDED
WELD - BRAZE - CUT - MELT - SOLDER - HEAT TREAT

The WELDRITE combination–tested and proven by countless commercial and amateur users, is now offered direct to you at the amazingly low price of only $12.00. No Gas–No Gauges–No Spark Lighter needed. Always ready for immediate use–Just plug WELDRITE into 110-115 AC or DC outlet. Uses standard welding and brazing materials available at all welding supply stores. WELDRITE furnished complete with Converter Unit, #1 Single Holder with attached Alligator clip, for welding metal up to 3/16" thickness, using up to 3/32" rod, and #2 Double Holder with Copper Tipped Dual Carbon Electrodes for Cutting, Brazing, Heat Treating, Soldering, etc. Starting welding materials and instructions included.

Ideal for home workshop. Invaluable for body and fender shops, garages, repair and machine shops, manufacturers, etc.

SEND NO MONEY! 5 DAY TRIAL OFFER
Order your WELDRITE Electric WELDER-CUTTER C.O.D. today. Pay postman $12 plus postage charges (wt. 4 lbs.) or send $12 and we pay postage. Either way, if not satisfied, return WELDRITE in 5 days, and money will be refunded. WELDER HOOD–Approved lens found in hoods costing to $10–only $3.95.
California orders please add 2½% sales tax.

CALIFORNIA TECHNICAL PRODUCTS CO.
448 So. Hill St., Los Angeles 13, Calif. Dept. B-6

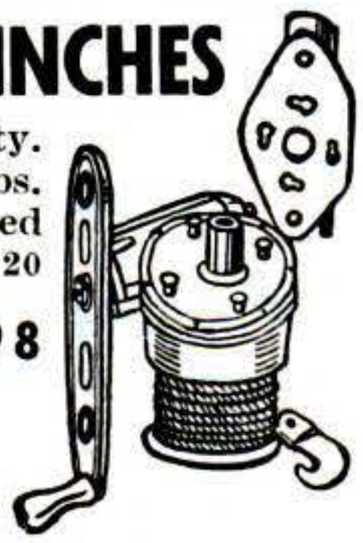
How to Write

Short Stories, Mysteries, Novels, Articles—at home in spare time

The demand for writers is creating great new opportunities for people with an urge to write. It's not as hard to succeed as you may imagine. Most famous authors come from ordinary walks of life. At home, you too may learn fiction writing, the best basis for all fields — short stories, novels, features, articles, radio scripts. Palmer Institute's Home Study Training (Established 1917) is endorsed by Rupert Hughes, Ruth Comfort Mitchell, Gertrude Atherton, Katharine Newlin Burt and other famous authors and by scores of successful graduates. Complete instruction material, professional coaching develop your own style. FREE book and lesson show how you may enjoy an ideal part time or full time career. Write today (no salesman will call). Veterans: advise us if you are eligible for G.I. Training.

PALMER INSTITUTE OF AUTHORSHIP • Desk U-68 • 1680 N. Sycamore • Hollywood 28, Calif.

New BOMB HOISTS-WINCHES



New shipment. 2,500 lb. lifting capacity. Small, compact. Light weight, only 16 lbs. 20 feet of cable with hook. Three speed crank handle. May be motor driven. 20 to 1 ratio. Release pin type cable reel out. Load held any position. FOB. K. C., Mo. Only **$14.98**

Mounting Bracket & Hanger for quick attachment..... **$1.98**

Send ck. or M. O. Please no COD's.

MIDWEST SURPLUS SALES CO.
2531 INDIANA KANSAS CITY, MO.

Learn *Glamour* PHOTOGRAPHY

The only complete home study glamour course, with authentic texts, illustrations, and the personal coaching of internationally famous glamour photographer, W. R. Harrison. LEARN to build costumes on models, create backgrounds, construct oscaloris, etc.

LEARN Hollywood secrets of glamour technique, including the 34 basic poses, makeup, lighting, costuming, etc.

FREE BROCHURE! Get full details now, WRITE TODAY! State if veteran.

HARRISON STUDIOS 8661 West 3rd St., Dept. S-6 Los Angeles 36, California

---

How to Become A Good Penman

Free Book tells all SEND 10¢ FOR NAME CARD & SHADING PEN

For fun & profit $$$$ Get your copy now

The Tamblyn School of Penmanship F-439 Ridge Building, Kansas City Mo. U.S.A.

Get Ready for Big Opportunities!
Engineer Dobe

TOOLS AND EQUIPMENT SENT WHEN YOU START

I Will Train You at Home Until You Get a GOOD PAY JOB in DRAFTING

Get a better job with more pay and pleasant working conditions. Get into Drafting -where all products start. I will train you at home—give you experience—on the same kind of jobs you will do with the best paying firms. I furnish instruments and all equipment when you start. Write today for vital facts and FREE book. Give age.

ENGINEER DOBE • Div. 2A, Libertyville, Ill.

WERE $8.50 NOW $3.00 with leatherette case

Send Cash, Check or Money Order—We Pay Postage or C.O.D. plus postage!

SENSATIONAL SALE!
Aviation Type **SUNGLASSES**
24K GOLD PLATED
SAME TYPE AS USED BY ARMED FORCES

LIFETIME WRITTEN GUARANTEE. Ground and Polished Glass. Approved by the Bureau of Standards, Wash., D. C.

A. L. SMITH, Dept. P
124 East 25th Street, New York 10, N. Y.

When You Want the Best, RISCO Has It!

CIRCULAR FLUORESCENT

All G.E. Parts, with 4" cup or for flush MTN.

As previously advertised—white or chrome finish including bulb—your cost **$9.50.** Your choice—circline 32 watts, circlarc 36 watts. Large Decorative Glass **$1.25** extra. Remit in full and we pay postage. 50c extra west of Miss. Rv. Buy direct and save.

DO YOU HAVE *GHOSTS* IN YOUR TELE-SET?

Trap it out with Netco, Television interference eliminator. Absorbs FM, amateur and all other external interference. Connects in 30 seconds, no soldering—Results guaranteed, from 40 to 120 MC-Range Knob Control. List for $10—Your cost **$6.** Prepaid in U.S.A. Order Yours Today.

V.M. velvetmixer

RECORD CHANGER

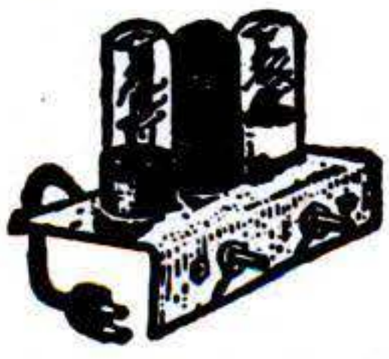
Plays 10" & 12" record at the same time. Easily attached to your radio $15.50
Detrola Record Changers $13.75

$15.50

PHONO OSC —2 tube AC-DC..... wired and tested **$2.75**
2 TUBES.....$1.20

Phono Amplifier

3 tube AC-DC. Wired and tested volume and tone ctls. **$2.75,** uses 12SQ7, 50L6, 35Z5, set of 3 tubes—**$1.95,** output trans—**39c** 5" alnico spk. **$1.19**—will drive up to a 8" spk.



25% on C.O.D. orders—Free Catalog—Order from this Ad
WHOLESALE DISTRIBUTORS

RISCO ELECTRONICS, 25 W. Bway, N. Y. 7, N. Y.

Copyrighted material

Earn BIG PAY Now!

thousands of ambitious men helped

FREE EMPLOYMENT SERVICE

• BIG SHOP TRAINING •

Learn These Trades in the Big Allied Shops

Choose one of these **6** LEADING TRADES

- Machinist Trade
- Tool & Die Making
- Tool, Die & Machine Designing
- Drafting (all branches)
- Tool Engineering
- Industrial Product Design & Illustration

Largest School of its Kind in the World

FREE! BIG METAL TRADES ILLUSTRATED BOOK

APPROVED FOR VETERANS

WRITE TODAY: A 1c Postcard will do.

ALLIED SCHOOL OF MECHANICAL TRADES
1338-1340-1342 So. Michigan Ave. Est. 1928
446 Allied Bldg. CHICAGO 5, ILL.

E. Z. SILVERPLATER $1.00

Plates as it polishes, retards tarnish. 1 application—it's silverplated. **Postpaid**

P.E.P. 335 MARKET ST. PATERSON, N. J.

SCREWY-MIX BARGAINS

Handy Workshop Kits—All New Finest Quality

1—Assorted machine screws, sheet metal screws and bolts, sizes 2-56 to 3/8-24, various type heads. Three pounds $1.15. Five pounds $1.50.
2—Mixed Steel Rivets 1/16" to 1/4" diameter, various lengths, round and flat heads—five pound pkg. $1.00.
3—Mixed aluminum rivets—50c lb. Mixed cotter pins 35c lb.

Minimum order one item $1.00—mixed items minimum $1.50. Add 15c postage per order.

JAY-CEE SALES CO., 4554 Grand River Ave., Detroit 8, Michigan

---

GARDEN TRACTOR

3, 4, 5 H. P. On market nearly a quarter century. No belts. No chains. Worm driven. 2 clutches. Power turning. All tractors guaranteed. Full line of attachments. Buy direct from factory. Write Dept. 601 for free catalogue.

RED E TRACTOR COMPANY RICHFIELD, WISCONSIN

PROFITS

MAKE YOUR OWN RUBBER MOLDS

A wonderful opportunity to realize tremendous PROFITS! Start in basement or garage—cast thousands of perfect book ends, plaques, figurines, ash trays, ornaments, etc. Use rubber molds for speed production. Yes, **MAKE YOUR OWN.** Sample kit only $1.00—Foreign $1.50. Inquire **TODAY!**

PLASTIC ARTS STUDIO Route 2 • Dept. 3 • Muncie, Ind.

RAISE *Money Making* CHINCHILLAS

Several females and a male start a large herd which will furnish you an income for years. Just a few feet of space are required. No experience needed. We furnish all instructions. Write world's largest breeder today for free details.

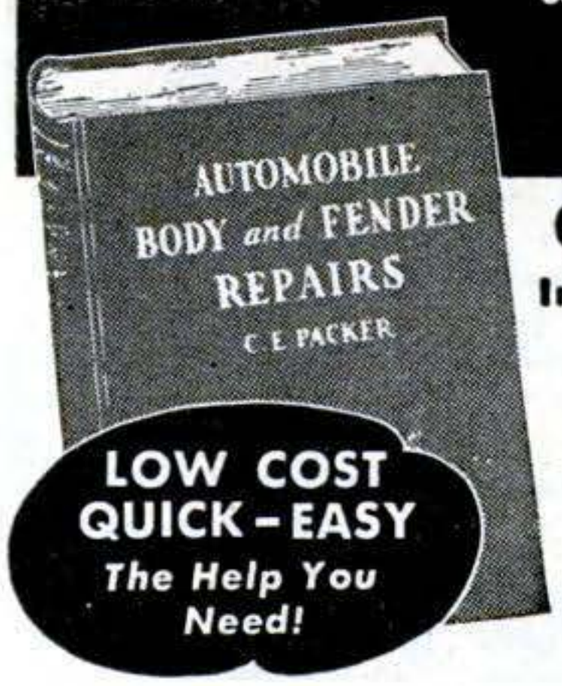
WILLOW BROOK FARM, R16A, Sellersville, Pa.

MONEY for MEN ALL DATA FREE

THE PLASTEX Industry needs manufacturers on small scale and for big production of Lamp and Clock Stands, Art Goods and Novelties in Plastex and Marble imitation. Experience unnecessary. 1/2c material makes regular 10c store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. Big chain store orders now being placed. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3400 Third Ave., New York 56, N. Y.

Make More Money in AUTO BODY and FENDER REPAIRS



LOW COST QUICK-EASY *The Help You Need!*

233 Pictures—Diagrams
325 Pages of Vital Facts

Covers methods, tools, materials—How to get business—How to start your own shop. Latest information and pictures.

GET THIS BOOK NOW

In Your Own Home Send No Money **FREE TRIAL**

GET YOURSELF a share of the big money car owners are spending to keep their older cars looking good. This practical book will put you right into this profitable business. No experience needed. Get a good job or start a business of your own with little or no capital. Biggest selling book of its kind. Thousands in use. Mail coupon today—money back if not fully satisfied.

Mail Coupon

GOODHEART-WILLCOX CO., Dept. Div. 3A
1321 S. Michigan Avenue, Chicago 16, Ill.

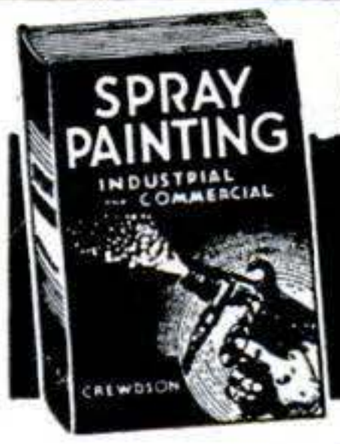
Send Auto Body and Fender Repair, $3.50. If not satisfactory I will return in 5 days and you will refund money paid.

( ) Remittance enclosed, sent postpaid.
( ) Send C.O.D. Postage extra.

Name .....

Address .....

City ..... State .....



NEW 1948 Enlarged Edition
AUTO PAINTING Now Included

Make More Money SPRAY PAINTING

Learn QUICK EASY, LOW COST

OTHER VALUABLE PAINTING BOOKS

House Painting Methods — with Brush and Spray Gun. 400 pages, over 150 illus. and color chart. Only **$2.50.** Book No. **2.**

•

Cyclopedia of Painting and Decorating. 350 pages, 288 illus. Best all around book on painting ever published. Only **$3.50.** Book No. **3.**

Complete Instruction for Professional Use and 'Round-the-House Jobs

Get this new 1948 spray painting book to help you on the job. Use it also for better and time-saving paint work around the home. Thoroughly practical—covers every phase of spray painting technique—industrial, commercial, auto, studio and sign work, interior decorating and exterior painting. Tells what paint or other finish to use, how to mix colors, how to use all types of equipment, how to make new flock and suede finishes.

NEW EDITION NOW READY

New edition has added chapters on Auto Painting, Electrostatic Spray Painting, Agricultural Spraying and Automatic Spraying. If you do any kind of painting you need this book. Over 160 pages, cloth binding, illustrated. Only $2.00 postpaid. Check number **1** on coupon below.

MAIL COUPON Money Back if Not Satisfied

Frederick J. Drake & Co., Dept. 5A
600 W. Van Buren Street, Chicago 7

1 2 3
(Circle numbers wanted)

Please send me the books checked below. If not satisfied I will return them in 5 days and money will be refunded.

☐ Check or money order enclosed $.....Send books postpaid.
☐ Send C.O.D. plus postage.

Name .....

Address .....

City ..... State .....

Drake Books are Sold by Leading Booksellers

Copyrighted material

WAR SURPLUS AND HUNDREDS OF OTHER BARGAINS

STOP WATCH

Genuine Elgin 15 Jewel movement. Ideal for split second timing. Full sweep split second hand graduated in 1/10th seconds. Stem wind, start, stop and reset. Used but guaranteed perfect. A splendid value. Shp. wgt. 1 lb. **No. 200**—Each..... **$9.95**

MESS KITS

Regulation two-piece Army Mess Kits with folding handle. Used, but perfect. Weight 2 lbs. **No. A116**—Ea.. **69c**

CANTEENS

Reg. U. S. issue canteens. Plastic screw top chained to body. Slightly used but perfect. Wgt. 1 lb.
117—Metal
118—Plastic—Ea. **69c**

CANTEEN CUPS

All metal. Folding handle. Wgt. 1 lb. **No. A120**—Each.....**25c**

CANTEEN COVERS

Heavy canvas. Button fastener.
New **No. 530**—Each.....**69c**
Used **No. 119**—Each.....**35c**

WIRE CUTTER

Heavy duty type with compound leverage. Cuts up to ¼ inch wire. Extended upper jaw acts as feeder to cutting edges. Insulated handles. Ideal for farm fence work and shop use. Shp. wgt. 2 lbs. **Stock No. 392**—Each. **$1.95**

Heavy Duty Rubber Gloves

BRAND NEW

Extra heavy—extra long. Brand new, high quality gum rubber for softness and ease in use. Designed for heavy duty industrial service — protection in handling chemicals, acids, etc. A real bargain at this low price. **Stock No. 295**— Per Pair, Only..... **79c**

AVIATOR'S OXYGEN OUTFITS

Bail out type. Consists of all metal tank, release valve, gauge and breather hose, all enclosed in khaki colored cloth bag. These tanks are loaded with oxygen at 1800 pressure. Ideal for use as reserve oxygen supply for all types of emergency use. Shipping weight 4 pounds. All brand new. **Stock No. 391**—Each... **$4.95**

OXYGEN TANK

Loaded with aviator's breathing type oxygen at 1800 pounds pressure. Tank measures 13½x5½ inches with rounded ends. Tank is of solid metal fitted with brass release valve at top. Brand new! Loaded—ready for all types of emergency use. Shp. wgt. 13 pounds. Ship exp. only! **Stock No. 390**— Each, only..... **$3.50**

POPULAR RECORD ASSORTMENT

Fifty records of modern dance, race, blues and hillbilly selections. No two alike. Famous name bands and artists included. Used in juke boxes, but guar. perfect. Shipped exp. collect only—no exchanges or refunds. Wgt. 28 lbs. **No. A303**—50 records..... **$9.64**

No. A300—25 Records. All Dance. Wgt. 14 lbs..... **$4.88**

No. A301 — 25 Records. Hillbilly, Race and Blues. Wgt. 14 lbs. Set.. **$4.88**

No. 302—25 Records. All Hillbilly numbers. Wgt. 14 lbs. Set.. **$4.88**

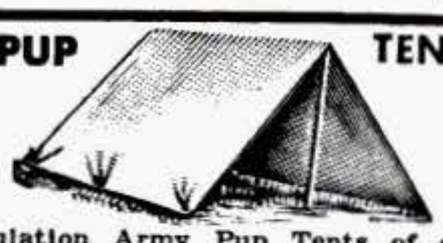
FLEX. NECK FLASH LIGHT

Ideal trouble shooter's flashlight. Flexible neck lets you direct light around corners and inaccessible spots. Brand new! Plastic case with BX type neck. Uses 2 standard flashlight batteries. (Less batteries) Shp. wgt. 2 lbs. **No. 205** Each **$1.39**

WATERPROOFING COMPOUND

Govt. surplus! A clear liquid formula for waterproofing tents, tarpaulins, canvas clothing, etc. Equally efficient on old or new materials. Gallon covers 100 to 120 square feet. Stays flexible. Will not peel or chip. Shp. wgt. 10 lbs. **Stock No. 423.**
Per Gallon..... **$1.49**

PUP TENTS

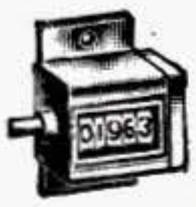


Regulation Army Pup Tents of durable, brown canvas. Used, but in good condition. Fine for campers, outdoorsmen, Boy Scouts, etc. Wgt. 8 lbs. **A100**—Tent only.... **$3.95**
A110—Tent, new **$7.95**
A101—Ropes, wooden poles and stakes for above. Per set.....**$1.00**

ARMY AIR CORPS TYPE SUN GLASSES

Ideal for driving, sun glare, sports and work. 24 carat gold plate frames with Pyralin sweat bar – adjustable nose bands. Large aviation type lenses. Case included. Shp. wgt. 1 lb. **No. 238**—Per Pair..... **$2.95**

VEEDER ROOT COUNTING MACHINE



Five wheel type—counts to 99,999 and repeat. Nickel finish case. Has ⅛ inch round shank. Use it for any counting job. Brand new. Shp. wgt. 1 lb. **No. 241.** Each..... **98c**

7 LB. EXPERIMENTER PARTS ASSORT. KIT

A "gold mine" for the radio serviceman. Hundreds of valuable radio parts, new radar and electronic parts and subassemblies, coils, resistors, trimming condensers—worth many times this low price. **A130R**—7 lbs.... **$1.79**

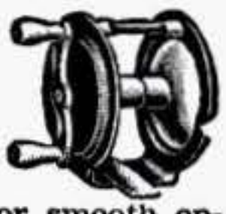
ARMY TENTS 16x16 Ft.

A value you can't beat. Big 16x16 ft. pyramid tent with 4 foot drop wall. Used but in excellent condition. Poles not included. Fine for camping out, carnivals, etc. Worth twice this money. Shp. wgt. 100 lbs. **Stock No. 521**—Each only.... **$35.00**

STIRRUP PUMP

Works with any pail or bucket. Shoots a high pressure stream up to 30 feet. Use it for spraying garden and trees, for whitewashing, fire fighting, drainage, etc. Complete with 10 foot flexible hose. All brand new. Regular $3.80 value. **No. 244**— Each..... **$1.49**

FISHING REEL



Exceptional quality for this low price. Has rugged one piece frame. Ratchet drag. Single action. Attractive catalin handles. Brass bearings for smooth operation. Full 100 yard line capacity. Brand new! A splendid value at this low price. **No. F412**, Each.. **98c**

BAYONET BLADE

Fine forged steel. Ground but not polished. May be made into throwing or hunting knife or spear. Blade 6¾x⅞ inches, 11¾ inches overall. Will take and hold a fine edge. Shp. wgt. 1 lb. **No. 664-R**—Each..... **49c**

STRANDED AVIATION CABLE

Flexible 133 strand wire cable, 5/32 inch diam., 3300 lb. break test. Lengths up to 450 feet. Use as tow rope, guy wire, clothes line, etc. Weight per 100 feet, 4 lbs. Specify length wanted when ordering (minimum, 100 ft.). **Stock No. 421.** Per Foot..... **4c**

Officers Watch Compass

Brand new gov't. surplus. Army-Navy model. Single jewel mounted needle. Silver colored dial. A splendid value. Shp. wgt. 1 lb. **A174**—Each.... **98c**

McCLELLAN SADDLE

Brand new! Top grade cowhide. 12 inch seat. Hair girth. Has straps for blanket roll and knapsack. Gun boot and sabre loops. A real buy for any horseman. Worth much more. Shipping weight 15 lbs. **Stock No. A145.**
Each..... **$16.95**

WOOL SLEEPING BAG

G.I. type 100% wool with 30 inch Talon zipper. Used but renovated for reissue. Shp. wgt. 3 lbs. **No. 165.** Each **$3.95**

AMMUNITION BOX

Used for 50mm ammunition. Heavy, all metal design with latching top and folding handle. Provides safe, fireproof storage for valuables, etc. Measures 12x6x7½ inches. Used but in new condition. Shp. Wgt. 8 lbs. **No. 338**—Each **79c**

RUBBER SUIT

Fits over your regular clothes and shoes. Can be cut apart for waist high waders, hip high or knee high boots, also arm length rubber gloves. Heavy gum rubber over fabric. Fine for those who work in the water, commercial fishermen, sewer diggers, etc. All brand new! Wgt. 14 lbs. **No. 183** —Each..... **$4.95**

Please add 75c for postage.

HIGH PRESSURE SHATTERPROOF TANKS

TYPE D2

A high pressure shatterproof tank of 500 cubic inch capacity—for 50 pound pressure or 6.9 cubic feet. All metal—measures 6½x24 inches. Threaded plug end vents. Shp. wgt. 6 lbs. **No. 388**— Each...**$2.45**

TYPE F1

A high pressure shatterproof tank of 1000 cubic inch capacity—for 50 pound pressure or 13.8 cubic feet. All metal—measures 9½x 17 inches. Threaded plug end vents. Shp. wgt. 11½ lbs. **No. 389**— Each...**$3.75**

ORDER DIRECT FROM THIS AD

Values galore! Hundreds of hard-to-find items for home, shop and outdoors. Make remittances by money-order, bank draft or personal check. Send 25% deposit on C.O.D. orders. No C.O.D.'s on orders for less than $5.00. Include sufficient postage on parcel-post orders—any overage will be promptly refunded. All quotations F.O.B. Chicago. Used items and materials are guaranteed serviceable and as described. Your money back if not more than satisfied.

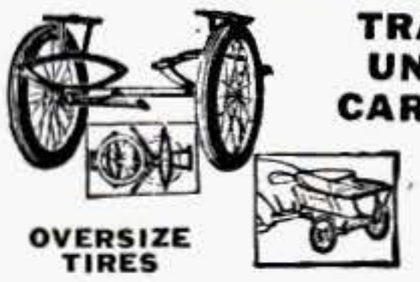
SEND 10c TO COVER POSTAGE AND MAILING ON BIG CATALOG—READY IN ABOUT 60 DAYS

WRITE FOR YOUR COPY TODAY

STARK'S

Dept. PS6
509 S. State St.
CHICAGO 5, ILL.

TRAILER UNDER-CARRIAGE



OVERSIZE TIRES

Build your own trailer for boat, camping gear or delivery service. Fitted with 26 x 2.125 U.S. Royal Tires. Motorcycle type wheels. Solid steel axle, leaf type springs and body mounting brackets. All brand new! Hitch not included. Folds to fit trunk of car. Shipped express collect only. **No. 199**, Ea. **$24.95**

POPULAR SCIENCE Classified Opportunities

Save time—Save Money

Classified Ads only 70c per word per insertion, payable in advance. Minimum ad 10 words. To be included in August issue, copy should be in our office by June 28th. August issue on sale August 1st.

POPULAR SCIENCE MONTHLY—351 FOURTH AVE.—NEW YORK CITY 10

1 AUTOMOBILES

FROM Speedway to Roadway! Track-proved Hi-speed Heads and Manifolds now available for your passenger car! No special tools needed! Increase horsepower 25%! Astounding getaway! Free illustrated catalog. Speedsport. 5747AB Waveland. Chicago 34.

CLYMER'S Indianapolis Race History book. Complete details every race held 1909 to date. 352 large pages. 1100 illustrations. Postpaid $3.50. DeLuxe Edition Fabrikoid binding. gold lettering $5.00. 1946 and 1947 Race books $1.00 each. Complete Driver History book $1.50. Specify ones wanted. Clymer. Dept. B-6U. 2125 W. Pico. Los Angeles 6. Calif.

SEE our ad under motorscooters for Midget Car bargains. Midget Motors Directory. Athens. Ohio.

"CUSTOM Styling" manual — easily make car look Hollywoodized. custom. ultra-beautiful by quick inexpensive methods! 100 photographs. instructions on customizing. restyling. streamlining; new and old cars. Also model. sport. conversions; accessories; mufflers; engine "soup up" specifications! Most complete book $2. Almquist Engineering. Milford 12. Pennsylvania.

HOT Rod Racing book. 90 photographs. illustrations famous record holders used California Dry Lakes. Contains hotrod tips. closeup action shots. specifications. 8 beautiful drawings suitable framing. $1.50 Postpaid. Clymer. Dept. B-6V. 2125 W. Pico. Los Angeles 6. Calif.

DUALTONE Chrystaline packed California mufflers for all automobiles. Large chromed tailpipe extensions. Spinners. Tailored shackels. Dual manifolds. Hi-Compression Heads. Fender Skirts. Send 20c Illustrated Catalogue. Deduct 20c from first order. Dualtone Mufflers. 2636B India Street. San Diego 1. California.

AUTOMOBILE Racing. Sixth Edition. 100 illustrations. Working drawings with building instructions for Ford-60 midget. California roadster. Offenhauser racer. Details on racer parts. Sample entrance blank. World's record 158.5 M.P.H. rear engine four-wheel drive car. Interesting information for fans. drivers. mechanics. $2.00 postpaid; $2.25 C.O.D. Ray Kuns. Department 62. Cincinnati 27. Ohio.

INSTALL V-8 engine in your Model A for extreme acceleration. more top speed. smoother performance. Complete details. photographs. $1 Postpaid. A-V-8. Box L-2. Eaglerock. Los Angeles 41. Calif.

MODEL A Ford instruction book. Complete details care. maintenance. 35 charts. drawings. A Must for "A" owners. $1.00 postpaid. Clymer. Dept. B-6W. 2125 W. Pico. Los Angeles 6. Calif.

MIDGET Car book—Complete plans for easily building inexpensive midget racers. two passenger highway roadsters. 3-wheel cars. scooters. etc. Motor data. supply sources. 75 photographs. blueprints! $1.98. Almquist Engineering. Milford 12. Pennsylvania.

MAKE your Ford fast! Complete details. photographs. How to construct 120 mph Hotrod. $1 postpaid. California Bill. Box L-2. Eaglerock. Los Angeles 41. Calif.

MAKE Your Model "A" do 100 mph. Lightning acceleration. breath-taking top speed. Complete details. Photographs. $1 Postpaid. Four Barrel. Box L-2. Eaglerock. Los Angeles 41. Calif.

FAMOUS Car catalog reprints. Duesenberg. Italian Maserati racing and new Sport car. Mercedes-Benz. new rear-engined Isotta Fraschini V-8. Rolls-Royce "Silver Wraith." Miller Race cars. Cord. Rayfield Cyclecar. V-8 Chevrolet. Stanley Steamer. Doble Steamer. Specify catalog desired. $1.00 each postpaid. Clymer. Dept. B-6X. 2125 W. Pico. Los Angeles 6. Calif.

"SPEED & Power Handbook"—Very latest methods! Construct your own superchargers. water injectors. compression heads. fuel saving devices—Easily! Get racing speed. acceleration. dynamic power increases from any automobile! Build stock conversions! Fast roadsters! Includes "Economy Information"—ingenious formulas! Illustrations! Mileage tricks! Tuning techniques! Ignition. Fuels. Manifolds. Carburetion. Speed secrets! Including "Re-styling Ideas" — Photographs! Streamlining! Model revising. Customizing. Hot-rods. Sport changes. Accessories! Parts lists! Drawings! $1.98 complete. Newhouse Industries. 5941-A2 Hereford. Los Angeles 22.

DIRECT from California — Beautiful dress-up accessories! Speed equipment for all passenger automobiles! Power! Mileage! We pay shipping costs! Picture-catalogue 25c. Newhouse Automotive Industries. 5941-A3 Hereford. Los Angeles 22.

FOREIGN car books. British Sports cars. 96 makes described. fine illustrations. specifications $2.00. Post-War British cars. 34 makes illustrated. specifications. $2.00. British Motor Industry from 1896 to 1946. 176 photos. drawings. $1.50 postpaid. Clymer. Dept. B-6Y. 2125 W. Pico. Los Angeles 6. Calif.

"VAPO-STEAMATIC" Water Injection. Thousands using this famous automatic system. Easily assembled (for less than $1.00)—Saves gasoline! Engineering triumph—up to 33 miles per gallon. Reduces wear! Greatly increases horsepower! Speed! Longer engine life! Smoother performance! Copyrighted "Installation Handbook"—Diagrams. Illustrations. Including "Vapo-Injection"—Tractors. motorcycles. trucks. airplanes. $1.00 complete. Newhouse Industries. 5941-A1. Hereford. Los Angeles 22.

"POWERIZER" Water injector—Increases speed. acceleration. mileage to 30%. Easily assemble yourself for few cents! Sensational performance! Prevents wear. knock. oil pumping! "Installation Manual" includes "hopup" tips. $1. Almquist Engineering. Milford 12. Pennsylvania.

RACING Car builder book. 22 drawings. Racing rules. Contains information on cams. compression. balance. midgets. big cars. roadsters. V-8 speed data. $2.00 postpaid. Clymer. Dept. B-RB. 2125 W. Pico. Los Angeles 6. Calif.

HIGH Compression heads. V-8. More speed. acceleration. power. Offenhauser or Edlebrock $49.00. Offenhauser $55.00. Give make. model V-8. Catalog 10c. Clymer. Dept. B-63. 2125 W. Pico. Los Angeles 6. Calif.

BUILD speedy midget track racer from castoff parts! Plans. specifications. construction information. $1.00. Motor Supply. Box CS-1682. Toledo. Ohio.

CUSTOM-Car photographs. 130! Manual; Album. together $2. Finest or refund! Post Publications. 723-JC. Arcadia. California.

INTERCHANGEABLE Parts book. New book tells every automobile part that interchanges with others. Same parts many times vary 100% in price. This book enables garages. mechanics. dealers. owners to buy under cheapest listing. Tremendous savings for users. $15.50 postpaid. Clymer. Dept. B-IP. 2125 W. Pico. Los Angeles 6. Calif.

SAVE Gas. Use man's greatest asset. No gadgets. 25c. Columbia. Box 672. Englewood. N. J.

"SPEED & Mileage" manual—Obtain greater speed. mileage. racing performance from any automobile! "Original" book shows easiest Soup Up methods! Speed tuning! Mileage secrets! Complete Data! Photographs! Instructions on building speed equipment. economizers. mufflers. "water injectors." manifolds. superchargers. fuels. heads. "Hotrods." Speedsters. Fast Conversions. Engines! Latest "Hollywood Customizing" information. catalogues. Parts lists! $1.98. Almquist Engineering. Milford 12. Pennsylvania.

IMAGINE. 250 miles per gallon your car now. Literature 25c. Jet Engine Co.. St. Augustine. Fla.

POWER and speed equipment for all cars. Tops in heads. manifolds. cams. mufflers. etc. Save on Edmunds. Edelbrock. Offenhauser. Meyer. Weiand. or Knudson equipment. New illustrated list 25c. Chevrolet or V8 hopup instructions $1.00. Give make. Alden Motors. Oakland City. Indiana.

HOT-Rod manual. fast Fords. photos. instructions. $1.50 air mailed $1.75. Racing parts list $.25. Hollywood Hot-Rod Los Feliz. Box 9626 S. Hollywood 27. California.

CLYMERTONE. Twin muffler sets. beautiful sound. complete with necessary welded pipes. E-Z installation. Ford V-8. $20.00. Chevrolet set with split manifolds. $37.50. Specify car model. Clymer. Dept. B-64. 2125 W. Pico. Los Angeles 6. Calif.

AUTOMOBILE Racing Book. Fifth edition-revised. Tells how to build dirt tracks bodies. frames. engines. Records. superchargers. rules. formulas. plans. stock conversions. roadster racing. fast Fords. $1.00 postpaid. $1.15 C.O.D. Ray Kuns. Department 274. Madisonville. Cincinnati. Ohio.

USED-Car Buyer's handbook. Complete tests. photographs. dealers' tricks. Save money. grief! $1.00. Post Publications. 723-TC. Arcadia. California.

2 AUTO SUPPLIES & EQUIPMENT

PLATING Outfits For Autoparts. Connect to a battery. No tanks used. Outfits furnished. Free particulars. Gunmetal Co.. Ave. K. Decatur. Ill.

THE A B C of water injection. Complete information Free. Advanced Automotive Products. 563-7 Lake Road. Webster. N. Y.

Copyrighted material

AUTO parts for all autos and trucks. Trans. motors, differentials, fenders, carburetors. Also Body Parts. Security Auto and Truck Parts, 1923-PS Grace, Chicago 13.

AUTO Parts. We have them. New or rebuilt. Prompt shipment. Save money, buy direct. Factory Warehouse. Write requirements. Specify Car make. Mechanics Auto Parts, 3807-PS N. Ashland Ave., Chicago 13.

PAINT Your Car—wipe it on. $3.75 postpaid. Guaranteed two years. Literature, 15 samples free. (Dealerships.) Cover-Nu, 1911-N, Lubbock, Texas.

"SPEED" Handbook — The Original "Hop-Up" Publication! Easily increase speed, power, mileage to 30%! Non-technical information on engine tuning, Speed Data, Racing Secrets, carburetion, compression, formulae, balancing, fuels. How to build power equipment, Fast Conversions, "Hot-Rods," economizers, superchargers, methods, Photographs, Catalogues, etc.! $2.00. Almquist Engineering, Milford 12, Pennsylvania.

MARK tools, guns, parts, with our 1/16 steel letter and figure sets, both for $7.50 postpaid. We can supply any size letter or figure set at reasonable prices. Arrow Sales Co., Billings, Montana.

GASOLINE mileage increased. Lubricant Solvenizes residues on piston rings and valve guides; protects cylinder walls and de-sludges crankcase. Low cost. Gallon, $2.95 cash with order plus express charges. Injun-Aide, Lock Box 505, Little Rock, Ark.

CARBURETOR repair kits, electrical service parts, fuel pumps, etc. State requirements. Carburetor Service, 600 La-Prairie, Ferndale 20, Mich.

PISTONS: Old & New Cars. Discounts. M. Merryman, Lawndale, Calif.

SENSATIONALLY Advanced Water Injector. Automatic injection control. Positive and economical performance. $10.00 Postpaid. State make and year car. Redco, Room 23, 25 Front St., Exeter, N. H.

CONVERTIBLE Tops—Completely sewn. Easily installed. Reasonable prices. Free literature. Rio Top Company, 1370 Roanoke Ave., Newport News 9, Virginia.

REUPHOLSTER Your own car or operate upholstery shop. Complete auto upholstery instruction manual $2.00 Money Order. C.O.D. First Upholstery Service, 3439 Michigan Ave., Chicago, Ill.

"NEW-Look" makes cars look new. Sample. Box 394, Union, N. J.

PAINT your car with spray, brush or puff for $2.95. Available in black, dark blue, gray, dark green, light green, maroon, tan. Shipped prepaid if money accompanies order, otherwise C.O.D. plus postal charges. M-H Products Co., 3625 South Grand Avenue, Los Angeles 7, Calif.

STOP with confidence. Aircraft-type hydraulic pistons for most brakes. Chrysler-built automobiles a specialty. Free circular. Price Engineering, Box 1923, Wil-LaBrea Sta., Los Angeles 36, California.

WELDING bodies and blocks, repairing fenders easy with Hobart Welders. Low cost, adds profits. Catalog free. Write Hobart Welders, Box P-682, Troy, Ohio.

MOTORISTS save gasoline by Vacumating overrich mixtures. Fits all cars. For free particulars write Vacumatic, Dept. 1340, Wauwatosa, Wisc.

FREE details: How to paint your car—factory finish. Bass Company, 35-B West 32nd, N. Y.

SAVE gas! Instant starting. Power! "Lektron" spark intensifier. Easily installed. $1.25 plus C.O.D. Guaranteed! State make car. Electronic Industries, Cleveland 11, Ohio.

3 AUTO TRAILERS

BUILD Your own trailer! Save money! Have every feature you want! Plans for house, sport, camp and utility trailers. Catalog describing 9 models 10c. 15c in Canada and overseas. Jim Dandy, Box 125-B, Wausau, Wisconsin.

HOUSE Trailer Frames. Toy-Q-Les Axles with springs, wheels, electric brakes. Bull-Dog hitches. Literature on request. Box 19, Eau Claire, Wis.

TRAILER Plans, Parts, Accessories—Complete line. Catalog plus booklet "Trailer Building" $1.00—Marine Mart, Buffalo 7A, N. Y.

4 MOTORCYCLES, BICYCLES, SUPPLIES

MOTOR Scooters, bicycle engines. 120 miles gallon. Dime for catalog. Clymer, Desk B-65, 2125 W. Pico, Los Angeles 6, Calif.

WHEELS! Build wagons, scooters, mowers, trailers, wheelbarrows, grocery carts, baby carts, play pens, baby carriages. 4" to 16". Free list. Trulsen Mfg. Co., 811 E. 31, Kansas City, Mo.

MOTORCYCLISTS. Chromium accessories. New and reconditioned motors. Complete Indian Parts. Expert motor rebuilding. Indian Motorcycle Sales, Kansas City 1, Missouri.

WHEELS, Tires, Tubes for Motor Scooters, Midget Cars, Wheelbarrows, and Industrial equipment. All sizes. Bicycle Parts, accessories. Largest stock in United States. Send dime for list. Cycle Transport Company, 1241 S. Michigan Ave., Dept. C, Chicago 5, Illinois.

MIDGET Car $12. Motorbike $15. Servicycle $30. Brand New Regal Motorscooters $37.50, less motors. Midget motorcycle $35. Motoscoot $25. Salisbury $50. Whizzer Motorbike $55. Twin Harley $60, all complete. Gasoline engines $3 up. Plenty brand new 2 h.p. engines in original crates. 5500 small balloon tires $1 up. Mailorder only. Send 25c for Big War-Bargain catalogue Number 25, just out, listing the above and almost 400 other bargains in new and used motors, motorscooters, midget cars, parts, etc. (35c by First Class Mail). Midget Motors Directory, Athens, Ohio.

STREAMLINE Motorbikes and Motorscooters. Send 20c for photos. Thomas Fisher, Antigo, Wisconsin.

172 BRIGGS Stratton Motors. Send Dime. Cheap Donz, 1252 Thurman, Camden, N. J.

MOTORCYCLE pistons and parts, new, used. Harley, Indian, Henderson, Super-X. List 10c. Ballak, 811 N. 9th, St. Louis, Mo.

FLAT Rate Repair manual for Harley-Davidsons. Gives flat rate charge for every operation. Every dealer, owner, mechanic needs this new book. $2.00 postpaid. Clymer, Dept. B-FR, 2125 W. Pico, Los Angeles 6, Calif.

PROFESSIONAL Midget racer, motorscooter, midget roadster, midget motorcycle. Plans, specifications contained in illustrated handbook, 25c. Directory of bargain priced used motors, motorscooters, Servicycles, included free! Midwest, 3839 Drummond, Toledo 6, Ohio.

ASSEMBLE sensational, clutch operated motorscooter speedster yourself! We furnish factory finished kits ready to bolt together. Rockbottom prices—Fork $4.95, etc! Complete plans, literature, 25c. Zipscoot, Toledo 6, Ohio.

MIDGET racer $40.00. Cushman motorscooter $15.00. Motorbike outfit $15.00. Harley-Davidson motorcycle $35.00. Send 25c for new catalog listing amazing bargains in motorscooter, motorbikes, midget cars, motors, parts. Gail, 538 Erie, Toledo, Ohio.

MIDGET automobile $15.00, Cushman motorscooter $20.00, Indian motorcycle $30.00, tires 75c. Send 25c for printed catalog listing sensational bargains in motorscooters, Servicycles, midget cars, used motors, parts. Associated, Box CS-1764, Toledo, Ohio.

COMPLETE decal trim for Bicycle fenders, fork, bar, red on cream or blue on cream 50c. Illustrated folder 3c stamp. Dealers wanted. Walthers, 123 N. Broadway, Milwaukee, Wisconsin.

HARLEY-Davidson "45" engines. Gov't. surplus, rebuilt with Generator and Carburetor. Few left, close out $89.00. Clymer, Dept. B-6Z, 2125 W. Pico, Los Angeles 6, Calif

5 AVIATION

FREE! How to fly cross-country-safely—how to land at airports—told in booklet "Happy Landings," sent to Pilots and Students. Please enclose 10c for postage and handling. Hangar Flying, Dept. (13K6), 112 E. Grove, Bloomington, Ill.

FLIGHT Engineers Manual (Zweng) $4.00; AAF Sextants $12.50; Aerial Cameras $175.00; Hamilton AAF Master Navigation Watch $65.00; (Free Folder). Pan American Navigation Service, 12021-D3 Ventura Blvd., N. Hollywood, Calif.

VETERANS: Be a pilot. Tuition paid under the G.I. Bill. Private, Commercial, Flight Instructor, Instrument, and Multi-engine Courses. Opportunities for part-time employment while studying. Ideal flying conditions. Write for information. Gottschalk School of Aeronautics, Adrian, Michigan.

PROPELLERS—2 & 3 blade, for snow-ice sleds, boats. Catalog. Standard Aerocraft, Box 387, Ft. Worth, Texas.

7 ELECTRICAL SUPPLIES & EQUIPMENT

ELECTRIC Fans? Assemble your own. 16" correctly balanced aluminum fan blade, ½" bore, $2.25. 18" all welded guard, $2.50. Use any ordinary motor. No COD. Ted Riseman, 207 N. Fifth St., Springfield, Illinois.

LAMPS — Build own Originals, parts wholesale any amounts. Catalogue 10c. Brown Lamp Co., No. 501, Wellston, St. Louis 12, Mo.

SELSYN motors, 3¼ x 5½ heavy duty 115 volts, 60 cycles, $7.50 per pair. Weber Electric, 150 Maple, Hershey, Pa.

LAMP sockets, mogul sockets, three way switches, tumbler switches, receptacles, cordsets, electrical repair parts, lamp parts, etc. Catalog 10c. Gearon Company, 6405H North Oakley, Chicago.

LAMPS—All parts to build or repair. Illustrated catalog 10c. Gyro Lamps, 5402 Clark, Chicago 40.

LIGHT-Flex is a new and modern method of light concentration—a revolutionary, decorative compound which will give up to 84% more light when applied to the ordinary household light bulb. This scientific development reflects the light and beams it where you want it. You can get more from your electric light dollar with Light-Flex. The $1.00 kit treats over twenty bulbs and lasts as long as the bulbs. Ask your dealer or send $1.00 for this handy household kit to Light-Flex Co., Inc., 607 Powers Bldg., Rochester, N. Y.

BUILD Model train motors inexpensively. Piper, Box 182, Royal Oak, Michigan.

8 WELDING, SOLDERING

WELDER—New portable champion special Transformer Welder; 110/220 volts, AC, 8 heat stages. Welds, brazes, solder, cuts all metals. Complete with electrode holder, helmet rods, carbons, fluxes, cables. Also special Flame Weld Torch. Easy to use. Full directions. Splendid for shop, farm and home repairs. Guaranteed. Only $27.50. Money back guarantee. Also resistor model, Now $14.95. Magic Welder Co., 239 PS Canal St., New York, N. Y.

TRANSFORMER Welders 110 V. Welds ½" Steel $29. Morris Welding Service, 1850B State, Schenectady 4, N. Y.

COMPLETE guaranteed portable welder. Amazing value. Only $19.95, postpaid. Write for full details. Grenville, G.P.O. Box 1011, N.Y.C. 1.

A.C. WELDERS, Sanders, power mowers. Bargains. Holgerson Co., Canton, Kans.

WELDING—a profitable trade. Demand for trained men. Learn quickly at best equipped school in U. S. Non-profit. G.I. Approved. Catalog free. Write Hobart Welding School, Box P-685, Troy, Ohio.

WELDERS for all requirements. Free catalog. Write Hobartweld, Box P-684, Troy, Ohio.

"BUILD-Ur-Own" AC Welder and AC Power Plant Combination. Weld, run tools, lights, motors away from power lines. Save $350. Easy with Hobart generator plus auto engine. Free instruction book. Write Hobart Welders, Box P-683, Troy, Ohio.

10 MACHINERY, TOOLS, SUPPLIES

DRILL GRINDER—Grinds drills to factory accuracy. Calipers with direct reading scales. Circle cutters. New Tool grinder. Lowest prices. Free literature. Factory, 811-A East 31st, Kansas City 3, Mo.

SHEBEL Saw Filer, $7.50. Files all saws. Free trial. Circular. 730A So. 2nd St., Milwaukee 4, Wis.

CHUCKS. (Genuine Westcott) Independent, Universal, threaded 1½"—8 for South Bend, Atlas, Logan, Clausing, Craftsman lathes. Also other chucks to 16". Top value. Free literature. Westcott Chuck Co., 3700 Walnut, Oneida, N. Y.

Copyrighted materi

SPRING steel adjustable tool clips eeps your tools and parts handy. Send 10c r sample. Baron Products. 20014 Rogge. etroit 12. Mich.

POWER Tools. Build your own with ewis Castings. Save up to 80%. Complete stings, materials and blueprints supplied r 23 woodworking and metalworking ols. Free catalog. Write today. Lewis achine Tool Co., 3217 Union Pacific Aveue, Dept. S, Los Angeles 23, California.

BAND Saw—Special $14.95. Ideal for obbyists & Home Workshop. Circular ree. Woodcraft Tools Inc., 147 E. Lake, inneapolis. Minn.

CONCRETE Block machines from $39.50. atalog free. Concrete Equipment Comany. 5466 Gravois. St. Louis 16. Missouri.

BACK-Geared metal and wood-cutting " band saw. Lowest priced practical all urpose machine on market. Write for cirular. Backus Machine Co., Boyd. Wis.

SEWING Machine handicraft — Your wing machine equipped with Bright Bit ill cut wood, leather, etc. Simple—nooth cut—no drilling—no dust—Simple isel needle replaces ordinary needle to roduce precision cutting. See May issue. merican Legion Magazine. Proof 25c. ewing Handicraft $1.00; 3 chisels $1.00. right Bit. East McKeesport. Pa.

TWO Cylinder oil free compressors. 6.5 .F.M. @ 90#. Pump only lists $52.00, our rice $35.00. For full particulars write ir Compressors, 2536 St. Clair Ave., leveland 14. Ohio.

DRILL GRINDER for twist drills $2.95. ee ad on page 248.

2 FARM MACHINERY

NEW airplane tires. tubes. wheels. bearigs. spindles. For harvesters. implements. wbeds. Free pictures. World's largest ock. Airplane Tire Company. Dept. 20. ox 89. Merced. California.

4 BOATS, OUTBOARD MOTORS, ETC.

FULL size, cut to shape boat patterns. ueprints. 7½—38 feet. Illustrated "Build Boat" catalog. 10c (coin). "How to Build oats" book, $1.00. Cleveland Boat Blueint Co., Dept. A-77. Cleveland, Ohio.

MARINE conversions for Ford and Jeep ngines. Catalog 10c. Lehman Manufacturg Company, Department A, Newark 2, ew Jersey.

INBOARD Hulls. Outboard Runabouts. ydroplanes. Hunting. Fishing boats. railers. Accessories. Kits. Catalog 25c. uebl Boats. LeSueur. Minn.

OUTBOARD motors—good values, used otors. Also used parts for most makes nd models. Crandall-Hicks Co., 912 Comonwealth. Boston. Mass.

MARINE Fittings. Accessories—thounds of items (Pictured. Priced)—Prompt elivery. Catalog $1.00. Marine Mart. uffalo 7A. N. Y.

BELLY tanks. Free picture. Buck's uto Parts. 89V. Merced. Calif.

AIRPLANE Jettison tanks—streamlined. ½ Foot. tear drop shaped. 165 gallon. gauge steel. weighs 75 pounds. ideal for oats. etc. $12.50. $9.75 each three or ore. freight prepaid. No C.O.D. orders. anks shipped halves nested with gasket. olts not included. General Sales. 205 arket S.W., Grand Rapids 3. Michigan.

MARINE Fir Plywood for boat building. end 10c today for complete stock and rice list. Trans-Marco Corporation. 70 ast 45th Street. New York. N. Y.

BOAT Patterns. Kits—See Display adv. age 247. Marine Mart. Buffalo 7A. N. Y.

5 ENGINES, MOTORS, ETC.

WINDING Data. listing 225 motors. sine and three phase, $1.00. Motor Data, ox 7631. Kansas City 3. Mo.

RANGER Engine—Aircraft—All new in iginal case. 570 HP, 12 cyl. V type. Airoled. Engine Spec. No. 177. Complete th spark plugs. Original Government st over $12.000.00 each. Special offer 00. Crated weight 1200 lbs. No C.O.D. rite for complete description. "Amazing chman's." Dept. PS. 23 Herman Street. ochester 5. N. Y.

"BUILD-Ur-Own" portable Gas Drive c Welder. Save $350 with Hobart generor plus auto engine. Free instruction ok Write Hobart Welders. Box P-686. oy. Ohio.

GOVERNORS for Auto Engines. Ball bearing. $26.75; plain $17.25. Candee. 2641¼ S. Hill. Los Angeles 7.

ELECTRICAL repair men. send for literature on Motor Winding tester and A.C. motor winder. Motor Industries. Quincy. Illinois.

18 BODY-BUILDING COURSES

BAR-BELLS. Dumbbells. Exercise equipment. Courses. Free booklet. Good Barbell Co., Reading. Penna.

19 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY

SINKER molds for making your own sinkers. Several styles. many sizes. Free illustrated folder. Reading Instrument Co., Box 78. Reading. Pa.

"SHOTGUNS"—"Rifles"—"Handarms"—"Ammunition"—"Rods"—"Reels"—List 10c. PS-Rudolph's. Atchison. Kansas.

5.000 BARGAINS, firearms, binoculars, war relics, catalog 40c. Smith Museum, Runnemede, N. J.

BOWS-Arrows. write headquarters for Archery equipment. Quality products. Popular prices. Catalog 10c. Large illustrated hand book instructions. aiming and shooting. 50c. Archery. 617-A So. State. Chicago 5.

180 PAGES antique and modern pistol. sword. etc. values. 50c. Robert Abels. 860½ Lexington Ave.. New York 21.

BASEBALL. Softball. Equipment. uniforms. supplies. Catalog ready. Sportsman Headquarters. 670 East 42. Brooklyn 3. New York.

CLOSING Out:—435 antique Firearms:—35.000 coins. relics. cartridges. swords. flintlocks. carbines. minerals. antiques.—Illustrated Catalog 25c. Heike. Wenona 2. Ill.

SHOTGUNS. Rifles. Revolvers. Over 500 Modern. Obsolete. Also Cartridges. List .10 coin. Ed Howe. 26 Main Street. Coopers Mills. Maine.

20 FIELD GLASSES, TELESCOPES, ETC.

TELESCOPES. Binoculars. Microscopes. —big bargain catalog free. Brownscope Company. 24 West 45th Street. New York.

POWERFUL Astronomical telescopes easily made. Perfect lenses and instructions; 100 power $3.00. 100 and 200 power $4.00. 100. 200 and 400 power $6.00. Clear vision and full power guaranteed. Instructions alone 10c. Suffolk Science Service. Manorville. N. Y.

GOVERNMENT Surplus. Terrific bargains. telescopes. binoculars. lenses. prisms. send stamp for catalogue. G. Jaegers. 123-26 Rockaway Boulevard. South Ozone Park 20. New York.

TELESCOPES. Binoculars Wanted. Zeiss. Jensoldt. Ajack. Bought. sold. trade for American scopes. Reticules. coating. repairs. Robert S. Thomas. Silver Spring. Maryland.

ASTRONOMICAL Telescopes. binoculars. microscopes; Bought. sold. repaired. Books. Lists 10c. Rasmussen-Reece. Amsterdam. N. Y.

INFRA-Red filters glass 1¼" (40 mil) diameter. mounted. Snap on camera or binocular. $1.00 per set. Variable Density Filter with eyecups to fit 7x50 binoculars. Control light and glare to assure best conditions. Adaptable for photography. Complete $1.50. Buy both $2.00 postpaid. Ross. 68 West Broadway. Section M. New York. N. Y.

ASTRONOMICAL Mirrors — Made to order. Herman K. Stump. Winchester. Indiana.

ASTRONOMICAL Telescope lens kit. 50X—100X—200X—400X—powers $3.00. Microscope lens kit. 50X—100X—200X—400X—800X—$2.00. Plans included. Pfleegor Optical Co.. PS-6. Sunbury. Pa.

POWERFUL astronomical Refracting telescope. equatorially mounted. all metal. two eyepieces. $16.50. Bluhm Optical Lab.. 4213 Gifford Ave.. Cleveland 3. Ohio.

24 DOGS, BIRDS, PETS, RABBITS

$250 MONTHLY. Raising Angora Rabbits. Particulars free. White's Rabbitry. Newark. Ohio.

RAISE rabbits. Market provided. breeding stock furnished on Production Pay Plan. Literature 25c with hutch plans $1. Hansen's Rabbit Institute. 1347 Miller Avenue. Salt Lake City 6. Utah.

RAISE Chinchilla rabbits. Year-round money-makers from furs. meat. breeders. Experience unnecessary. Write today. Willow Farm. Sellerville 16. Pa.

$5.000 YEARLY possible raising Angora rabbits our Co-operative marketing plan. Iowa Angora Association. Cedar Rapids. Iowa.

$3.000 YEARLY Raising Angora rabbits. Particulars free. Vaughn's Rabbitry. Otley. Iowa.

MONKEYS. Pheasants. Guinea Pigs. Doves. Birds. Puppies. Pet Supplies. Catalogue 25c. Tampa Pet Supply Co.. Tampa. Fla.

RAISE Guinea Pigs. Make money at home. Big demand. Booklet free. Taylor. Box 426B. Hapeville. Georgia.

RAISE Guinea pigs. Make money. Write. Winfield Harrison. Fitzgerald. Ga.

RAISE "Golden Hamsters" for Laboratories. or Pets. Pem's Hamstery. 3010 10th Ave.. No. St. Petersburg. Fla.

ANGORAS. Giant Chinchillas. white giants—World's most profitable rabbits. Finest pedigreed. heavy-producing. prizewinners. Literature free. Grinsteads. Edwardsville. Illinois.

25 FROG RAISING

"HOW I Made Fortune Raising Frogs"—New Book $1.00. Satisfaction Guaranteed. Broel. 1035 Marlborough. Detroit 15. Michigan.

FROGS. Crayfish. fishing canes hardwood. Lists 10c. Vol Brashears. Berryville. Arkansas.

27 MILK GOATS

RAISE Dairy Goats. All about goats and goat milk in big. illustrated monthly magazine. Sample copy 25c. Special Introductory year subscription only $1 (regular $2 a year). Booklet. "Primer for Goatkeepers". Free on request. Dairy Goat Journal. Dept. 568. Columbia. Mo.

30 FARMS, OTHER REAL ESTATE

FARMS. Ranches. All kinds. sizes. Choice of location. climate. production. Information on irrigation projects Columbia and Missouri River Basins. Resorts. summer homes. Milwaukee Railroad territory: Washington. Idaho. Montana. Dakotas. Wisconsin. Upper Michigan. Central Corn Belt. Free folders. price lists. L. H. Robbins. 613 Union Station. Chicago 6. Illinois.

OZARK Lands for All purposes. Actual river frontages. 5 acres $90.00 and upwards. Free list and literature. Hubbard. 424-N. Minnesota Ave.. Kansas City 4. Kans.

GOOD FARMS—Ranches. Washington. Minnesota. Montana. Idaho. Oregon. North Dakota. Dependable crops. favorable climate. Write for literature. lists describing typical farm opportunities. Specify which state. J. W. Haw. 120 Northern Pacific Ry.. St. Paul 1. Minn.

CALIFORNIA. Group. Oil Lease sharing. Lots 50' x 150'. Deeds—$60.—$5. monthly. " "Lucky Delker" " 2219 Venango—Phila.. 40. Pa.

LOTS $300—convenient payments. California's finest garden section. On Morro Bay's scenic shores. Wonderful fishing. hunting. boating. bathing. Fertile soil. softest water. temperate climate. congenial community. Free literature. Richard Otto. 6560-Z. Hollywood Blvd.. Hollywood 28. California.

STROUT'S Farm Catalog—Free! Many equipped. Reduced Prices! Over 2800 bargains—Coast to Coast. Write Today. Strout Realty. 255-ZB—4th Ave.. New York 10. N. Y. 20 W. 9th St.. Kansas City 6. Mo. 453 S. Spring. Los Angeles 13. Calif.

CHEAP Homes. stock. dairy. garden. fruit. poultry farms. for retiring. strong. sick. folks. For hunting. fishing. longevity. health. happiness in Scenic. mild Ozone. write G. W. Starr. Ozone. Ark.

31 POULTRY AND SUPPLIES

RAISE Fryers new easy way. One man home plant earns $500 monthly. Booklet free. Poultry Guild. 1046-B So. Olive. Los Angeles 15. Calif.

32 PROFITABLE OCCUPATIONS

DETECTIVES Earn Big Money. Excellent opportunity. Detective Particulars free. Write. Wagoner. P-125 West 86th. N. Y.

Copyrighted material

$5000. from half acre growing Ginseng. seed supplied. Crop bought. Particulars 10c. Associated Growers. 1109 Corydon Ave., Winnipeg, Canada.

$40.00 WEEKLY. Made growing mushrooms. Fresh. Dried. Dominion Patent 331.583. free spawn. North American. 169Y Yonge. Toronto, Canada.

ANNOUNCING home study course in commercial baking. Practical basic training. Good field for those with aptitude. Nearly depression proof. Send for Free booklet, "Opportunities in the Baking Industry." National Baking School, 1315 Michigan Ave., Dept. 1723. Chicago 5, Ill.

MAKE beautiful costume jewelry at home for large profits, hobby or therapy. Free illustrated wholesale catalogue of sea shell, metal and plastic parts contains detailed instructions. Florida Supply House, Bradenton, Florida.

HYDROPONICS — Soiless Vegetables. cheap chemicals. 25c. Box 57. Bristol. Va.

EARTHWORMS. Send $1.00 for Revised Booklet on Soil Building & Better Composting. Coolville Earthworm Farm. Coolville. Ohio.

START lamp factory. Profitable. fascinating. easy to learn. Illustrated course teaches you. General instructions. wholesale catalog $1.00. Gearon Company. 6405H North Oakley. Chicago.

MUSHROOMS grown. Boxes. Barrels. Instructions 50c. Spawn $1.00. Gordons. 553 William. Winnipeg. Manitoba.

33 BOOKS, PERIODICALS, ETC.

MAGAZINES (back dated)—foreign. domestic. arts. Books. booklets. subscriptions. pin-ups. etc. Catalog 10c. (refunded). Cicerone's. 863 First Ave., New York 17. New York.

USED Correspondence courses and books bought. sold. rented and exchanged. Catalog Free. Lee Mountain. Pisgah. Alabama.

"ADULT bookalogues." 25c. Fifteen—$1.00! Free catalogs! Hirsch. Spring Valley 3. N. Y

FREE Particulars for book bargains. Rosenthal. 200 Ross. B'klyn 11. N. Y.

BIG Sparetime profits taking magazine subscriptions. Complete supplies. confidential catalog free. Cassell Publishers Service. Westfield. New Jersey.

TRADE Magazines—Business. Vocational. Diversion. Current single copies. All fields. Price list Free. Commercial Engraving Publishing Co.. 34S North Ritter. Indianapolis 19. Indiana.

BACK issues magazines. reasonable. Reedmor. 240 East 9th. New York. N. Y.

BOOKS. all subjects. promptly supplied. Alta Book Service. Box 258-A. Waterbury. Conn.

BACK-DATE Magazines. Books. Specific issues—years. Arkell's. Tarzana 2. Calif.

EXTRAORDINARY Books. Free Catalogue. Abbott-Dunhill. 752-G Northwest 66th. Miami 38. Florida.

STOCK Market—Latest research discloses factors timing market highs. lows. panics to exact dates. Send $10 to Orpha Publishing Company. Dept. J-20. P. O. Box 279. Berkeley. California.

ADULT books—Unusual Fascinating—Five $1.00. Free Bookalogue. Kogan. 1032-KL Church Annex. New York 8.

1948 CATALOG. wholesale directory. 10c. Latshaw Sales. Sunnyside-C. Indianapolis 44. Ind.

BOOKHUNTERS! All subjects. Send wants! Jaher Book Service. 620-K East 178 Street. New York 57.

35 MAGIC TRICKS, PUZZLES, ETC.

MAGICIANS', Gamblers' secrets exposed. Cards, Dice, Punchboards, Slot Machine. Catalog 10c. Book Co., Box 671. St. Louis 1. Mo.

WORLD'S largest professional magic shop. keeps you in touch with latest tricks. To receive mailings, send 35c for new catalog. Holden's. 220-P West 42nd St., N. Y.

LEARN magic. Ventriloquism. Mind-reading. Write for particulars. Quackenbuch. Big Flats. N. Y.

500 TRICKS. Send only 10c for Douglas' famous 112-page Catalog 500 Tricks. New magic for amateur. professional. America's fastest service for 25 years. Douglas Magicland. Dept. 2. Dallas. Texas.

MAGICIANS' Headquarters — 400-Page Professional Catalogue. pocket. parlor. stage tricks. World's finest magic. Send $1.00 for Catalogue (refunded first $5.00 order). Kanter's. S-1311 Walnut. Philadelphia 7. Penna.

VANISHING Quarter trick and catalog 25c. Sterling Magic Co., Royal Oak. Mich.

FREE Trick and illustrated Magic Catalogue. 25c. Hall Magic Co.. A-345 John R. Detroit 26. Mich.

THE Mysterious Headless Match Trick. 25c with pamphlet of magic and joke items. Powell's. P. O. Box 2155. Potomac Station. Alexandria. Va.

FREE! Large Catalog of magical apparatus if you remit 25c for "Magic is Fun" magazine. Robbins Co.. 152-F West 42nd Street. New York.

BE a Magician. Large professional magic catalog of latest tricks. 35c. Ireland. F-109 North Dearborn. Chicago.

TRICKY Magic Matchbox. It turns around. it stands. it opens. Confuses. amuses everyone. easy to do. Free To You if you send 25c for Big Illustrated Catalog of 425 Magic Tricks. Magician. 2463-D Kensington Ave.. Phila. 25. Pa.

HYPNOTISM! 25 Lesson Course. $1.00. Monarch. 38-S Jefferson. Auburn. New York.

MAGICIAN'S Pin. Ghost Illusion. Magic Book. Large Catalog. Everything Complete 25c. Magic Wand-S. 9W Colorado. Pasadena. California.

EARN Money in any crowd. Call names of strangers. tell unspoken question. Professional course mind reading. faked spiritualism. etc.. $1. Reiss. 3017-E Ocean Parkway. Brooklyn 24. N. Y.

LARGE 160 page catalog. just published. 35c. We have supplied the best tricks to beginners and professionals for 38 years. Chicago Magic Company. 2300-G No. Mason Avenue. Chicago 39.

"VENTRILLO." professional voice-throwing instrument and illustrated catalog 25c. POB-971. Philadelphia.

MAGIC tricks. fun novelties. Illustrated lists 10c. "Marean." 2200 Gorden. Hopewell. Virginia.

WHOLESALE Catalog 25c. "World's Largest Line." Manufacturers. 12-PS Churchlane. Philadelphia.

ITCHING. sneezing powders. eighteen other tricks free with jokers' Catalog 25c. 2404N15. Philadelphia.

DOLLAR Magic set free with Gigantic catalog 25c. Magex. 4462 Germantown. Philadelphia.

MYSTIFYING Pendulum Trick Stops and Starts at Performers Command 25c. University Shop. Box 921. Baltimore 3. Md.

36 GAMES, ENTERTAINMENT

HOME Model Slot Machines and Coin Operated Games. Write for catalog. Webb Distributing Co., Dept. P4. 6 South Kedzie Ave.. Chicago 12. Ill.

37 COIN COLLECTING

FREE! Foreign coin. banknote and Coin Collectors' Illustrated Catalog to approval service applicants. Send 3c postage. Tatham Coin Co.. Springfield-D50. Mass.

OLD Money Wanted. Do you know that Coin Collectors pay up to $100.00 for certain U. S. cents? And high premiums for all rare coins? We buy all kinds. Send 4c for Large Coin Folder. May mean much profit to you. Numismatic Co.. Dept. 30. Fort Worth. Texas.

30 MIXED Indian Cents $1.00. 33 Diff. Foreign Coins $1.00. International. 656 W. 171st. N. Y. 32.

25 DIFFERENT Indian Cents $1.00. 2 Genuine Roman coins 2000 years old.—$1.00. 10 Different $4.00. Del Monte. 725 W. 172d. N. Y. 32.

GET profit and pleasure in collecting old coins. Send 10c for 56 page illustrated coin catalog. You'll be delighted with it. Send for it now. B. Max Mehl. 374 Mehl Bldg.. Ft. Worth. Texas. Largest rare coin establishment in U. S. Established 48 years.

AMERICAN Coins wanted. State Quantity. Condition. Price. Von. 1319 Tenth Way. Sacramento 14. California.

COMMEMORATIVE $½ — Columbus. Washington. Cleveland. Stone Mountain. $1.50 ea. Illustrated Catalogue 25c. Norman Schultz. Salt Lake 9. Utah.

35 WORLD coin $1.00. Harry Elsholz. Box 9014. Pittsburgh 24. Penna.

ILLUSTRATED Information — U. S. coins. collectors and dealers prices. 302 pages. $2.00—Hobby Helpers. Dept. K. Box 665. Washington 4. D. C.

CLOSING out:—435 antique firearms;—35,000 coins. relics. cartridges. swords. flintlocks. carbines. antiques. minerals. Illustrated Catalog 25c. Heike. Wenona 31. Ill.

U.S. coins lowest prices. Send stamp for lists. Hutchinson. 3463 I Street. Philadelphia 34. Penna.

COMMEMORATIVE $½. All New—Pilgrim. Cleveland. Robinson. Long Island. Boone. Oregon. Texas. Each $1.90. General MacArthur Philippine 50 Centavos. Peso Set $2.50. Retail Catalogue 15c. Bebee Coin Company. 1180 East 63rd. Chicago 37. Illinois.

4-in-1 SPECIAL $1.00 bargain offer: (1) United States 1893 Columbian World's Fair half dollar; (2) Album for holding coins; (3) Large 56 page coin catalog; (4) Genuine wooden nickel. Yes! All four items for only $1.00. Order Today. Money Back if not pleased. Ben's Coin Shop. 72 W. Washington. Chicago 2. Illinois.

38 OLD STAMPS WANTED

I BUY Stamp Collections and accumulations. Charles Mekeel. 2101 East Market. York. Pa.

40 STAMP COLLECTING

DEALER'S Wholesale Catalog. Postage 3c. Franksco. 5031 Queensbury. Baltimore. Maryland.

ZOWIE-E-E! A Barrel of Fun for only a Dime! 500 United States Stamps—Absolutely unpicked and unsorted. just as received from church missions. Many varieties. including large commemoratives. airmails. high denominations up to $5.00! Stampdom's biggest package of fun. and you might find something really valuable!! Price only 10c to serious approval service applicants. Money back if not delighted. Illustrated bargain lists with each order. Mystic Stamp Co.. Dept. 55. Camden. New York.

WOW!! $10.00 Worth Of Fun—Only 10c! What a treasure hunt! Big package 500 Foreign Stamps from foreign missions. other sources. Includes Stamps from Africa. South America. Free French. Somali. Palestine. etc. Includes airmails. commemoratives and stamps worth up to 50c. This offer sent for 10c to Approval Applicants only. Jamestown Stamp Co.. Dept. 5. Jamestown. N. Y.

128-PAGE United States Catalog. 1,000 illustrations. 10c. Harris & Co.. 204 Transit Bldg.. Boston.

NICARAGUA "Tin Pan Alley" Diamond. Ecuador showing George Washington. and American Flag in natural colors. Fezzan. Trieste. "American Army" stamp First U.S. Commemorative. $100.00 Shanghai. Corsica. Anzac. Antique. others all 5c approvals. Capital Stamp Co.. Dept. 10. Little Rock. Ark.

FREE—Famous Americans set. plus Flag set. plus the National Parks set. plus the Presidential set to the $5. A total of 90 stamps absolutely free to customers for our unsurpassed United States or Foreign selection. Send 3c postage for 15 of the above mentioned stamps and full particulars. Triboro Stamp Company. 145 Nassau Street. Dept. 206. New York.

WORLD'S Largest Stamp (7½ x 14 inches). A real curiosity! Retails for 50c. only 3c to approval applicants. Tatham Stamp Co., Springfield 50. Mass.

200 DIFFERENT. including Roosevelt triangle. 5c to approval applicants. S. Avalon Stamp Co.. Springfield. Mass.

CHOICE of 35c Worth of stamps from our first U. S. selection Free to applicants enclosing 3c postage. Large selection to choose from. Act Now!!! S. D. Engel & Co., 38 Park Row. N. Y.

200 DIFFERENT Stamps—cataloging up to 15c each—only 3c to approval applicants! Littleton Stamp Co., Littleton 47. N. H.

"CONFEDERATE-States" twelve different unused 10c approval applicants only. "Stamps". Box Eighty-Seven. Albany 1. N.Y.

FREE Price List—Canada Unused singles. blocks—Bargains. A. L. Casey. Dieppe. N. B., Canada.

Copyrighted material

COLLECTORS outfit. Album. Hinges Gauge. Detector. 50 different stamps. 2 mint sets all 10c. Approvals. Carneta. 228 West 25th. N. Y. 1.

FREE—$25.00 Stamp collector outfit—Finest. most complete outfit ever offered: Large Scott album. valuable collection of 1050 different stamps. Airmails. Odd-shapes. Hi-values. "Stamp finder." Watermarker. magnifier. perf-gauge. tongs. and hinges. Actually over $25.00 value absolutely free when regular customer. Mail application now for Foreign approvals. Bargain Stamp Service. Dept. A. Santa Ana. Calif.

BRITISH. Spanish. French Colonies. Vatican. Hitler heads. and airmail packet. free with approvals. Pan-American Stampco. Box 145. New York 33. N. Y.

FREE! Crystal-Mount Sample. Harrisco. 204 Transit Bldg.. Boston. Mass.

UNITED STATES approvals complete coverage fine quality. attractive prices. Seminole Stamps. Box 1138-S. Coral Gables. Florida.

FREE. Irish commemorative collection. including Rebellion issue with approvals. Raymax. 123-X William St.. NYC 7.

U. S. 797 SPA Sheet only 5c to applicants for U. S. approvals. M. Haycock. 333—86th St.. Brooklyn. N. Y.

POSITIVELY Greatest free offer—Latest Scott's International $6.00 stamp album—covering entire world. contains 36.000 illustrated descriptive spaces; Scott's 1948 Standard $7.00 catalogues "Philately's Encyclopedia"—absolutely free to applicants for foreign approvals becoming customers. Approval Service. Box 1700. San Francisco. Calif.

FREE! $1.00. $2.00. $5.00 U. S.. Roosevelt. Hitler. Airmails. Approvals. Standard. Box 1616. Miami Beach 39. Florida.

WORLDWIDE Different: 200-25c; 500-60c; 1000-$1.50; 2000-$4.25. Beacon Sales. Maynard 3. Mass.

ROGUES Gallery Packet. Hitler-Mussolini. 30 others. 3c. Premium. Hartland 6. Me.

FOR Better U. S. approvals write today—Reasonable—Box 488 A. Minneapolis.

25 DIFFERENT India—3c with approvals. Premium with purchases. Branawein Stamp Co.. Box 92-P. Bayonne. N. J.

GIBRALTAR Packet Free—Nice collection Gibraltar—New Zealand Centennial—British Uganda—French Colonials—Early British Colonial—West Indies—South American—War stamps plus Philatopic Monthly Magazine. All for 5c postage. Empire Stamp Co.. Dept. P. R. Toronto 5. Can.

FREE — Canadian Sets Royal Visit. George VI. George V. Coronation. Jubilee. others. to approval applicants. Ensign. Box 118-P. So. Orange. N. J.

FINE Approvals. Fast. personal service. What countries do you prefer? I'll send their stamps. Milton Skinner. 432 Locust. Long Beach 12. Calif.

SPANISH Air set Free to approval Applicants. Flamingo Stamp Company. Box 4038. Pinewood Station. Miami 38. Florida.

BIG Money in Stamps. Buy at low cost. Sell at big profit. New book "How to Sell Stamps by Mail" reveals startling stamp secrets. Free particulars. No obligation. Donald Kelly. Publisher. M-9544 Whitcomb. Detroit 27. Michigan.

50 DIFFERENT Hungary stamps and our price list. one silver dime. Stampsales. Box 1649F. Oakland 4. California.

FREE!!! Mint British Colonies from Solomon Islands. Caymans. Grenada. Dominica. Turks Caicos. Absolutely free to new approval applicants. Viking. 130-P Clinton St.. Brooklyn. N. Y.

$5 CATALOG value 10c! 250 different stamps including Zanzibar. Roosevelt triangle. etc. 10c. Approvals. Moumblow. 740 Hegney. Bronx 56.

FREE! Hindenburg Set. Six Different Stamps. with approvals. Martin. Box 1128. Miami Beach. Florida.

200 DIFFERENT Stamps. 6c to approval service applicants. Nationwide Stamp Company. 1323 E. 16 St.. Brooklyn 30. N. Y.

FREE. Triangle. Roosevelt. Vatican. Ethiopia. Hitler Heads. Request Approvals. Florida Stamp Company. Box 807. Miami 5. Fla.

EVEN Roosevelt didn't have this! Makes a full page in your collection! Only 3c—Approvals included! George Wentz. San Marcos 18. Texas.

FIRST day covers on approval. Bob Knobel. 1918 S.W. 12th Street. Miami 35. Florida.

50 DIFFERENT United States 10c Price list free. Seidenberg. Cassopolis. Mich.

5 SETS—Five countries—Triangle. Orchid. Maps. Animals. With approvals 5c. Arthur Wirth. Norwichtown 2. Conn.

COLLECTORS in possession of extra stamps write for particulars. McPherson's Stamp Exchange Club. Branch. Mich.

ROOSEVELT Memorial set free with approvals. Johns' Stamp Service. Box 783. Holyoke. Mass.

SIX fascinating China Airmails 15c. Approvals. Kenda. 82 New Jersey Avenue. Brooklyn 7. New York.

25 DIFFERENT Stamps 10c. Tunis And Carpenter. Wakeman Ave.. Newark 4. N. J.

PENNY Approvals that satisfy. Neil Gronberg. Box 5441S. Philadelphia 43. Pa.

TRIANGLES. Different. 5—10c; 15—45c; Approvals. Albums 25c up. Lists 3c. Alatalo. Maynard 1. Mass.

GIVEN Fifty different worldwide stamps with approvals. Additional fifty up to 1.000 different. 10c per fifty. Jack Dudak. Streater 6C. Illinois.

FLAG Stamp Free With U.S. Approvals. E. Wenigman. 929 Oakdale. Chicago.

BRAZIL Diamond shaped set. 10c with approvals. Vargo Stamps. 6044 South Fairfield. Chicago 29. Illinois.

LIBERIA 283-288 for 15c. Page. Manners Ave.. Haverhill. Mass.

STAMPS. P. O. 801. Ottawa. Canada. Guaranteed. Beginners World One Dollar.

U. S. Approvals. Mint or used. Panthers. Box 52-S. Dorchester 24. Mass.

NEWFOUNDLAND 45 varieties $1.00. Real value. Mayfair. Regal Road. Toronto 10. Canada.

AMAZING bargain 25 different vaticans. only 10c. Wilhelm. 14646 58th Road. Flushing. New York.

110 DIFFERENT. Roosevelt. Hitlers. etc. 15c. Buckey. PS-208 Ludlow Bldg.. Dayton 2. Ohio.

DOLLAR each. 1500 foreign 2.000 Canada. 2.000 British. Seiden. 1331-S. Intervale. N. Y. 59.

MAGNIFICENT! United States Civil and Spanish war revenues. 50 to 87 years old. 10 different. 5c to approval applicants. AAA Stamp Company. Arcade Building. St. Louis 1. Missouri.

WE ARE giving stamps away. Send for our CHFS. Paramount Distributors. Box 864. Denver. Colo.

GENUINE "Goya Nude" set complete 35c. Approvals. Royal Stamp Company. Tamaqua 2. Penna.

BERLIN Bears. Complete set of eight and 100 different stamps only 10c to approval applicants. Reich Stamp Co.. 4647 Kenmore. Chicago 40. Ill.

TRIANGLES: Five different. Monaco Roosevelt. Nicaragua. Costa Rica. only 5c with foreign approvals. Modern Stamp Service. Box 12A. Wakefield Station. New York.

319 ALL different stamps from Vatican City. Palestine. Cyprus. San Marino. etc. with our sensational new illustrated 32 page Stamp Finder. It identifies all difficult stamps immediately. All for only 10c to approval applicants. A tremedous bargain. Garcelon Stamp Company. Box 818. Calais. Maine.

UNEQUALLED bargain. Stamps from over 25 different countries including Fiji. Swaziland. Pitcairn. Tonga. etc. Everything 10c to approval applicants. Bennett's. Box 252. Terminal A. Toronto. Canada.

PURCHASE from Purchase! Any country on approval. Elmer Purchase. 74 East Park Street. Newark 5. New Jersey.

AMAZING! Free introductory stamps gift. Vista Stampco. Box 1329. New Haven. Conn.

FREE! Airmails with approvals. Deane Stamps. Box 87. Miami 35. Florida.

BARGAIN! 2.000 foreign stamps $1.00. 5.000 $2.00. American Stamp Company. Wilmington A-4115. Delaware.

42 HOBBIES. COLLECTIONS

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors. Dept. 30-E. 2926-Eye St.. N. W.. Washington 6. D. C.

50 DIFFERENT army embroidered patches $1. Other bargains. Insignia Mart. 703B Broadway. New York 3. N. Y.

SIXTEEN beautiful Souvenir Luggage Stickers from Hawaii. only one dollar. Joe Wieser. Box 3531. Honolulu. Hawaii.

THERMOMETER Maximum-minimum. Navy type $10.00. Science Associates. 401 N. Broad Street. Phila. 8. Pa. Dept. PS.

UNUSED Match Book Covers. 100 all different $1.00. Free catalog. Charles Edelman. 1311 P East 84. Cleveland 3. Ohio.

EXCHANGE duplicates. Swappers everywhere. List free. Box 2166. Denver 1. Colorado.

MINIATURE electric motors 9/16" L.G. x 7/8" Dia.. 1½ to 7½ V.D.C. Penlight cells to 7000 R.P.M. ¾ oz.. reversible $2.00 each. Postpaid only. U.S. Industrial Assoc.. 475 Fifth Ave.. N. Y.. N. Y.

44 ANTIQUES, RELICS, INDIAN GOODS

FOSSILS Rare Assortment. over 200.000.000 years old. $1.00. G. Wershing. 221 North Solono. Albuquerque. N. M.

46 MINERALS & PRECIOUS STONES

BEAUTIFUL Arizona Agates. Polished samples and listings $2.00. Unpolished samples $1.00. Arizona Agate Mines. Cave Creek. Arizona.

ZIRCONS. loose. Pure white. Special: 3 Zircons approximate total Weight 3-kts. $6.00. We can supply Zircons in all sizes and mountings of all types. Send order or write for details today. B. Lowe. Holland Bldg.. Dept. P.S.. St. Louis. Mo.

GEMS. precious and semi-precious. all genuine from world wide sources. Deal direct. no overhead. save money. Catalog 10c Hill Co.. Route 7-K. Salem. Oregon.

MINERAL Identification Simplified—Valuable book identifies 2000 minerals. $3.50. Wetzel Publishing S.. Los Angeles 13. California.

ZIRCONS. mined. mastercraftsman cut in Siam. Diamond like brilliance. sparkle. 2 samples $1.00. 1 Carat $2.00. 2 Carat beauty $5.00. Others. Imhusex Ps. Box 232. White Plains. N. Y. Agents Wanted.

GEMSTONES—rough or polished. Custom cutting. Crystallized specimens. Information. free. Plummer's. 5068 Brighton. San Diego 7. Calif.

AMATEUR gem cutters send for interesting circular S. Southwestern. Box 3506. Station A. El Paso. Texas.

47 CAMERAS, PHOTO SUPPLIES

BASS says! At the sign of the old "Horse Trader." 38th year. Thousands of satisfied customers everywhere! Finest brands including Kodak. Bell & Howell. Argus. Zeiss. Leitz. etc. Satisfaction always guaranteed or your money back! Bass buys 'em. sells 'em. trades 'em. Write or wire. Bass Camera Company. Dept. AG. 179 W. Madison St.. Chicago 2.

UTILITEE Film Adapters use small color film in large cameras. At dealers or 655 North Broadway. Los Angeles 12. Calif.

HAVE you a camera? Improve your hobby of photography and learn how to make better pictures. Write today for our latest book catalog and sample copy of American Photography. containing articles and pictures by the world's foremost writers and photographers. Camera House. 607 353 Newbury St.. Boston 15. Mass.

200X TELEPHOTO Camera easily made. Trifling cost. Telephoto lens and instructions $3.00 postpaid. Instructions alone $.10. Suffolk Science Service. Manorville. New York.

YOUR prized negatives make beautiful photo enlargements easily. economically with the new Precise Photo Enlarger. only $22.20 complete. nothing else to buy. Send postcard for details. Tam Products. CS6. 3814 Wrightwood. Chicago 47.

Copyrighted material

CAMERA "Specials" for P. S. readers. Argus. Revere. Kodak. Buy. sell. write or wire Charles Wolfe. 167 Canal St.. New York 13. N. Y.

HAVE you a camera? Improve your hobby of photography and learn how to make better pictures. Write today for our latest free book catalog. Enclose 10c if you desire recent copy of American Photography, containing articles and pictures by the world's foremost writers and photographers. 607 Camera House. 353 Newbury St.. Boston 15. Mass.

MOEN'S Sensational 50th Anniversary Supersize Prints! Our amazing new $15,000 equipment will produce better. sharper supersize prints and faster. no longer need you wait. Send film today and see the difference. be the first to show your friends. 8 exposure rolls all supersize genuine Moentone Varigam prints only 35c; 12 exposure 55c; 16 exposure 65c. Moen Photo Service. 17 Moen Bldg.. La-Crosse. Wisc.

PHOTOGRAPHY for pleasure or profit. Learn at home. Practical basic training. Long established school. Write for booklet. American School of Photography. 1315 Michigan. Dept. 1742. Chicago 5.

PICTURES never before possible! 35mm Tri-X Film. Westonspeed 200 daylight. 160 Tungsten. Guaranteed. 36 exposure cartridges. 4 for $2.50. Per dozen $7.50 postpaid. Delta Photo Supply. 690-R Third Ave.. New York 17. N. Y.

KODABROMIDE Enlarging Paper—4¼ x 825 feet rolls. Enough for almost 2.000 4 x 5 enlargements. Single weight. Actual test prove its worth. Fully guaranteed. Reduces printing costs to a fraction of a cent apiece. Value over $35.00 . . . Our Price $2.25 postpaid in U.S.A. Delta Photo Supply. 690-R Third Ave.. New York 17. N. Y.

INFRA-Red Film makes for unusual pictures! Eastman Kodak. 35mm Infra-red. four 36 exposure reloaded cartridges. $2.50 postpaid. Short-dated but guaranteed. Delta Photo Supply. 690-R Third Ave.. New York 17. N. Y.

K-21 AAF Aerial Combat Cameras. manufactured by Graflex; motor driven. with flexible shaft; 24 volt operation. including step-down transformer to 110 voltage; may be manually operated. Complete except for lens and filters. New; original government packaging; positively the lowest price in the country. for a limited time only. $39.50. An Amazing value from Amazing Bachman's—Dept. PM. 27 Herman Street. Rochester 5. N. Y.

48 PHOTO FINISHING

THREE prints each 8 exposure roll 40c. Two each 35c. One each 25c. Reprints 3c. Fred A. Eastman. Bode. Iowa.

NEW Process developing and printing. 8 exposure rolls 35c. Mayfair Photo Service. Box 261-A. Toledo. Ohio.

FILM Processing to Contact or Oversize Charges on Delivered Prints Only. Mail 35c and Film to Harold's. Sioux Falls. S. D.

50 VELOX reprints. $1. Suburban Studio. 1410-S Bond. Rockford. Ill.

2 BEAUTIFUL Hi-Gloss prints each good negative and enlarging coupon with each 6 or 8 exposure roll developed 28c. Owlphoto Co.. Weatherford. Oklahoma.

ENLARGEMENTS 5x7 15c. 8x10 25c. Glossy or dull. Gorgeously oil colored 50c. Rolls developed and printed 25c. L & R. P. O. Box 1476. Milwaukee. Wisconsin.

BARGAINS—24 prints from roll 40c; 16. 30c. Reprints 2c. 16 3x4 enlargements 50c. Ten 4x6s 50c. Five 8x10s. $1.00. Studio. Albany 22. Wisconsin.

OIL coloring specialists. 8x10. $2.00; Smaller. $1.50. Copying. Enlarging. Ludwig's. 532A Geary. San Francisco 2.

ENLARGEMENTS. process flexibility permits individual perfection; 5"x7" send negative. 15c. 8"x10" 25c. H. Brandt. 1842 Wesley. Evanston. Illinois.

ROLLS developed and enlarged 2 to 6 times larger. 8 exposures 25c coin. 12 exposures 35c. 16 exposures 50c. Enlarged reprints 3c each. Alden Photos. 94-5 Astor Station. Boston. Mass.

51 MOTION PICTURES, SOUND EQUIPMENT

8-16MM. Silent-sound films. Complete rental library. All latest subjects. Free catalogue. (sample film 10c). Garden Film. 317 West 50th. New York 19.

BEAUTIFUL Kodachrome Slide and Lists 25c. Slide Supply Service. 3111 West Tuscarawas. Canton. Ohio.

8—16mm. SILENT—sound art films. International. 2120 Strauss. Brooklyn. N. Y.

"BASS says! 38 years of leadership means satisfaction to you! Finest equipment. 8 and 16mm. sound cameras. sound projectors. Bass buys 'em. sells 'em. trades 'em. Satisfaction always guaranteed or your money back! Bass Camera Company. Dept. A. 179 W. Madison St.. Chicago 2.

GUARANTEED fresh anti-halo outdoor movie film! Weston 12! Daylight loading! Processing free! Three spools double 8mm. $3.45! Six single 8mm for Univex. $4.60! Postpaid! Catalog. Eso-S. 47th Holly. Kansas City 2. Missouri.

FREE movie list. Superior Film Service. Box 713. Troy. N. Y.

SEND 10c for 8mm. 16mm catalogue. Sterling's. 679 Northampton. Easton. Pa.

CHILD is born by Caesarean delivery. Project outstanding movie production free. Send postal immediately. Movie Films. Hamilton 26. Ohio.

LEARN movie projection. management. Free Catalog. Theatre School. Elmira. N.Y.

16mm 50' Magazine Reloads. 4 for $5.25. Free Processing Doan. 18099 Hamburg. Detroit 5. Michigan.

EARN $8.00 to $10.00 daily with your movie projector. Details free. Metcalf (PS). 10806 Glenroy. Chicago 43. Ill.

KODAK Super-X Movie Film at Give Away Prices! Gov't. Surplus but Good as Gold! Tested and fully guaranteed. 16mm 100' $2.95; 50' Magazine $2.50; 8 mm 25' Double 8 $1.65. Processing included. Stock up for Summer Shootin'! Fotoshop. Room 179. 18 E. 42nd St.. New York City 17.

MOVIE Film at Tremendous savings! Kodak Super X. Gov't. Stock. Tested. Guaranteed! 16mm 100 ft. $2.95; 50 ft. Magazine. $2.50; Double 8mm 25 ft. $1.65. Super XX. 50c add'l. each roll. Free Processing. Fast Service. Photo Surplus Sales. Box K10. 12 Duane St.. New York City.

PARTY Art Films 8mm-16mm. Free Catalog. Wilco Photo Products. Dept. 58. 1186 Broadway. New York 1. N. Y.

GREATEST glamour movie! "Miss America of 1948." 8mm.. 50 ft.. $2.00. 16mm.. 100 ft.. $4.00. 83 subject catalog 10c. Glamour. travel. novelty. World in Color. Elmira. N. Y.

MOVIES Enlarged! Two 5x7 Photographs $1.00. Artcraft. 1600B Coney Island. Brooklyn 30. N. Y.

MOVIE Film Processing—Finest Automatic Machine Processing. 8mm. 16mm. 48 hour service. Also duplicating. editing. titling. other lab. services. Send for list of prices. Fotoshop Inc.. Room 155. 18 E. 42nd Street. New York City 17.

ELECTRIC Movie Cameras. 16mm. Army GSAP original condition. Value $200. Complete with f/3.5 lens New $32.50. Used $19.50. Accessories available for home conversion. Free literature. Completely converted Lektro. 16mm. Ready-To-Operate $59.50 Guaranteed. Magazine film for same. $2.50. includes processing. Fotoshop. Room 131. 18 E. 42nd St.. New York City 17.

FREE movie list. Superior Film Service. Box 713. Troy. N. Y.

PROCESS your own movie film. Process your movie film. Instructions. 50c. Duro Products. 1519 N. Eggert. Buffalo 21. N. Y.

FINEST Movie Screens. Inexpensive. Make them Yourself. Free Literature. Snow White Screens. Danville 2. Illinois.

8-16mm ART Movies. Free list. Box 103. Malden. Mass.

16mm. SOUND films. Real bargains in used cartoons. musicals. sports. novelties. Big list for stamp. Blackhawk Films. Davenport. Iowa.

EXCLUSIVE movies. projectors. accessories. Catalog free. Home Pix. 1674 Broadway. New York 19.

TWO Enlargements and negative from your Moviefilm. Send Frames and one dollar. Curiophoto. 1187 Jerome Ave.. New York 52.

ART model films 16mm rentals exclusively. adults list. Enclose stamp. Revere Films. Box 1051. Detroit 31. Mich.

GIANT Film offerings. 5c. American Films. 6711-S Sunset. Hollywood 28. Calif.

FREE movie catalog; Sample films. 10c. Goodwill Company. Jackson. Tennessee.

IMMEDIATE delivery of 16mm Sound projectors. Large stock of Castle. Official. Nu-Art and Pictorial films. Soundies Comedies. 16mm Ansco color film. Used 8mm. 16mm Sound. List Titlers. Splicers. Editors. Rewinders. (Home Movies. 41 South Fourth Street. Allentown. Penna.)

52 MUSIC, MUSICAL INSTRUMENTS

HARMONICAS: Hohner $2.90. $5.. $7.75; Chromatics. $15.. $25.. Accordions—Guitars—Trumpets—Clarinets—Bargain Instrument Catalog 25c. Musician's Shop. 2 E. Centre Street. Baltimore 2. Md.

BE Independent. tune pianos. music unnecessary. Practical Piano Tuning shows you how. $2.00 Postpaid. Chord-Slide Co.. Dept. PS. 3122 Lawrence Drive. Corpus Christi. Texas.

BIG Values in musical merchandise. Brass Reeds. Drums. Pianos. Guitars. At Mail order Prices. Send 10c for Catalog. Harden's Music. Marion. Ohio.

ACCORDION students. play better. sooner. with Visuade. $1.00. Arkay. Box 5772. Cleveland 13. Ohio.

NELLIE McGee words and music and 4 others 25c postpaid. 3 records these songs $1.50. Englewood Music Records. 516 Englewood Ave.. Chicago.

HOHNERS. Marine band. Single. doublereed. And Chromatic. harmonicas. button. and Pianokey accordions. Guitars. trumpets. all musical instruments. Hawes Music Store. Portland. Maine.

MUSICAL movements. $2.00 Free photo. Pevar's. 4218 Viola. Philadelphia 4. Pa.

53 SONG WRITERS

POEMS Wanted to be set to music. Free examination. Send poems. McNeil. Master of Music. 510-PS. S. Alexandria. Los Angeles. California.

SONGWRITERS. Songs Published Monthly. Advance Royalty. Send your songs or poems today for our exciting offer. Hollywood Tunesmiths. Dept. 10F-C. 1537 N. Vine. Hollywood 28. Calif.

SONGWRITERS: Send Poems for Free Examination and Outstanding offer. United Music. 116. Salem. Indiana.

$1.200.00 PAID Yearly to new songwriters. Opportunity for publication and advance royalty. No charge for melodies. Records. lead sheets furnished. Send song material now for free examination. Get details. Cinema Song Company. Dept. B-58 Beverly Hills. California.

HONEST outstanding music writing offer. Len-Tex Studios. Leonard 3. Texas.

POEMS wanted for musical setting. Send Poem for immediate consideration. Hamann Service. 626 Manhattan Bldg.. Milwaukee. Wisc.

PROTECTION. benefits. etc.. Memberships open. National Songwriters Association. Box 21. Essex Station. Boston 12. Mass.

SONG Poems set to music. Arranged & Recorded. Send poem for immediate consideration. Clover Recording Service. 441 No. Camden Drive. Beverly Hills. Calif.

SONGWRITERS—Protect your songs. Get the facts first. Free booklet. attractive offer. Song Service. 331-J West 46th. N. Y.

54 RADIOS, SUPPLIES & EQUIPMENT

MAKE Simple. Tubeless. Batteryless. Distance-Getting Crystal Radios. Crystal and illustrated instructions 25c postpaid. Allen. 427-S. Clinton. Mo.

U.S. Signal Corps Featherweight Earphones $1.00. Radio Service men and experimenters send stamp for our giant radio catalogue. Save dollars. United Radio Co.. (100-V) Newark 1. N. J.

FIX any radio. Amazing new instrument locates radio troubles double quick. Simple instructions show you how. Thousands in use. Write today for 24 page booklet "The Inside Story." Feiler Engineering Co.. 945 George St.. Dept. PS. Chicago 5. Illinois.

HALLICRAFTERS. National. other radios wholesale. Terms. Write. Henry Radio. Butler. Missouri.

RADIOMEN. Servicemen. Beginners—Make more money. easily. quickly. $250. weekly possible. We show you how. Information Free. Merit Products. 216-32H 132nd Avenue. Springfield Gardens 13. N. Y.

Copyrighted material

DISTANCES getting Crystal Radio with Electricity no tubes. Also Walky Talky crystal Radio instructions 25c. Andrew Bongiorno, Bath Beach P. O. Box 5. Bklyn. 14. N. Y.

BUILD your own precision Volt*Ohm *Capacity meter. Complete set of Plans 50c. Bradshaw Instruments, 348 Livingston St., Brooklyn 17. N. Y.

BARGAIN—Complete Crystal Radio Kit. only $2.75. Al's Radio Service. Sioux City 7. Iowa.

26 YEARS Experience radio repairing at your fingertips. I've repaired 45,000 radios. Have perfected simple system you can follow step by step. No calculations or formulas. Total price $2.00 postpaid or COD. Moneyback guarantee. Ross Radio, 14615-N Grandriver. Detroit 27. Michigan.

BUILD "Loudest" Crystal Radio. Instructions. Loud Crystal. Catalog: 25c. Amorose's. Route Four. Richmond. Va.

MAKE Selective distance getting crystal radios. One tube radios. Improved designs. Instructions. Crystal. Catalog. 25c. Radio Leaders. La Verne 6. Calif.

CRYSTAL Radio experimenters. Write immediately. Leslie Hulet. Lakewood. N. J.

24 PAGE Plans "18 Crystal Sets" (SW record 5800 miles). including "Radiobuilder"—25c. Laboratories. Eye-t. San Carlos. California.

FREE information television kit. easy to build. efficient. Famous $10.00 Western Electric Crystal for crystal sets 89c. prepaid. Murray Barron Industries. Box 74. West Englewood. N. J.

56 BUSINESS OPPORTUNITIES

$25 WEEKLY working two hours daily. No canvassing. No Manufacturing. Lycke. Box 2471. Cleveland 12. Ohio.

OPERATE profitable home business selling merchandise by mail. Fast sellers. Large profits. Powell Service, 5713 Euclid. Cleveland 3. Ohio.

RECAST old batteries into new. Latest achievements. Battery Laboratories. Minneapolis.

SPECIALTY Manufacturing, the big money business that can be operated anywhere, start on a very small capital; we supply dependable formulas and complete instructions; get interesting Free booklet. "Money-making Opportunities in Specialty Manufacturing." Howard Robinson. Ph. G.. 1300-B S. Ohio St.. Sedalia. Mo.

137 PLANS to make money local. mail order. Particulars free. Elite Co.. 220-A Grand St.. N. Y.

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late methods. No tanks or shop required. outfit furnished. Free Booklet. Gunmetal Co., Ave. E, Decatur. Illinois.

START home business making statuettes. plaques. artificial marble flooring. liquid marble. flexible molds. metallizing baby shoes. Amazing profits. Folder Free. Creative. 236-M. Winnetka. Illinois.

TRAVEL anywhere anytime. Earn $85.00 week up. Be your own boss. No experience necessary. Less than $5.00 investment required. Literature free. Traveler. La Grange 2. Indiana.

BIG profits and your own business casting new 1948 Metal Toys and Novelties. Latest scale model Autos. Original Ashtrays. Savings Banks. Water Pistols. etc. Enormous wholesale and chain store demand keeps manufacturers busy. No experience or special place necessary. Write for details and illustrations of patterns needed Metal Cast Products Co., Dept. E. 1696 Boston Road. New York 60. N.Y.

YOUR own plastic business at home. Produce costume jewelry. novelties. statuettes. liquid plastic. liquid marble. flexible molds. Write for free book. American Trades. Box 89-B-7. Cincinnati 39. Ohio.

A FACTORY in your home garage! Mfg. and sales rights. mechanics' waterless hand cleaner. $500—$800 monthly. No special equipment necessary. Western Aircraft Mfg., Dept. G. Los Angeles 6. Calif.

OPERATE profitable mail order business. Write Walter Service. 4159-B East 112th. Cleveland 5. Ohio.

A BUSINESS start on small capital! Write for full information on Manufacturing formulas-analysis-consulting services. Fairview Laboratory (Dept. A). Box 455. Tooele. Utah.

NO selling. operate vendors. amazing profits. details Free. Factory Silver-King Corp.. 622 Diversey. Chicago. Ill.

MEN with ambition apply only. Make money in Mail Order. Small Capital. Not a Get rich quick plan. Inquire. Bacon Enterprises. D 27. Ware. Mass.

MAKE and sell candy professionally. inexpensive to start. information free. Philip Pate. Kissimmee. Florida.

RAISE Ginseng. Roots Bring Fortunes. Circular Free. Fezler Seed Co.. Patchogue. N. Y.

PLASTER Paris gets hard as stone. Just mix in "Roc." amazing new chemical—Air bubbles come to surface. disappear. Finished casts hard. ring like a bell. Enough for 2.000 casts only $1.00 Postpaid Money back guarantee. So-Lo Works. Dept. E-203. Loveland. Ohio.

GET $1.25 guaranteed Fire extinguishers. Scheall. Box 225-S. Duluth. Minnesota.

SELL Greeting Cards. Pictures. Signs. Novelties. Books! Large Profits! Catalog Free! Elfco. 434 North Wells Street. Chicago 10.

MANUFACTURE Yourself: Cleaners. Polishes. Cosmetics. Formula Catalog free. Kemico. 10. Parkridge. Ill.

COLORGLAZED Concrete Pottery made without molds. Patented method. Cemetery products. novelties. tiles. Basement leak-sealing. Money-making projects. Booklet. details free. Men only. National Potteries. Grand Rapids. Minnesota.

MAKE perfume. Complete outfit $7.50. Information free. Lawson. 21 Joiner. St. Augustine. Florida.

START a home business in spare time. Make extra money. Literature free. McPherson. 510 SW 7th Court. Miami 36. Fla.

MANUFACTURE costume jewelry at home for profit. hobby. therapy. Free wholesale supply catalogue. Instructions Florida Supply House. Bradenton. Florida

RAISE Earthworms. Instructions $1.00. W. Huffman. 391 Pleasant Lake. Rives Junction. Mich.

AGENT or exclusive distributor for cigarette lighter Mfg. MacGregor. Tahoe Valley 15. Calif.

LIQUID Rubber for making flexible molds. Cast novelties. Sample bottle 25c. free literature. Chaney. 1130 E. 16th St. Jacksonville 6. Fla.

FOR an extremely profitable lifetime business operate a Collection Agency-Credit Bureau. Easily learned. Free folder. Cole & Associates. Syracuse 2. N. Y.

ELECTROPLATING booklet tells how to start your own business or work for others at big pay. Learn at home in spare time. Send postcard for free copy today. Hyde School of Electroplating. Room 523. 432 F Street. San Diego 1. California.

OWN Mirror Shop. Resilver Mirrors. Glass Sign Making. Electroplating. Supply Prices. John Sprinkle. V90. Marion. Indiana.

EXTRA Money? Free Details. Trable. 1018½B Elm St.. Dallas. Texas.

SALESMAN; nice profits selling costume jewelry. Dime brings literature. prices (refunded). Master Makers. P. O. Box 207. Dubois. Pa.

PROFITS From Plastics—A postcard will bring you free details. Plastics Research. Box 346. Alhambra. Calif.

$1.00 (RETURNABLE) Brings Details Guaranteed Profitable Plan. Stannette. 277 Madison Street. New York 2.

VENDING Machines earn big money! An investment as low as $10.50 will start you in this fascinating. profitable business that can lead you to the road of success and independence. Routes can be established and operated in either full or spare time with no experience needed. Write for full details and our free catalog illustrating our nut. candy. gum and stamp vendors; also slot machines. amusement games. etc. Parkway Machine Corporation. 623 W. North Avenue. Dept. 9. Baltimore 17. Maryland.

HOW To Start Your Own Business. Send for "Your Nest Five Years." a practical stimulating booklet written by successful business man outlines proved principles. methods and advice. Also reveals personal characteristics vital to achievement. Mail $1.00. Ten day money back guarantee. Dept. PS5. Angelus Publishing Co., Box 6767. Los Angeles 22. Calif.

BIG Money In Vending Machines—Smallest capital start brings immediate profits that build permanent profitable business. Starting instructions free. Becker Vendors. 105-P Dewey. Brillion. Wisc.

BRONZE Baby Shoes in Home Garage. Supply Source. and instruction $1.00. Hopkins. P. O. Box 491. Winnsboro. La.

NEW Proven Business. Clearing $400. month. Can Prove. Only Expense Advertising. Instructions $3.00. Germain's. 1450 19th. Columbus 11. Ohio.

TEN moneymaking home business opportunities. Details. 25c. Crawford. Box 1161. Bridgeport. Conn.

START Business! "With $1.00"! Moneymaker! Free Sample! Stephen's. Grand Junction. Colorado.

QUICK Money! "Repairing Car Batteries." At home! Easy too! Write. Batteryman. Grand Junction 1. Colorado.

MAKE flexible molds! Few cents each! Cast plaques. novelties. bookends! Free sample! H. Tooker. Hamilton 7. Ohio.

"GOLDEN Opportunity." How to Establish and Operate a Successful Mail Order Business. Free information. Palmer Publications. 4219-D Southwest Marigold. Portland 1. Oregon.

POPCORN Machines. Potato Chip outfits. Long Eakins Co.. 4863 Hi St.. Springfield. Ohio.

WHITE Liquid Rubber for making flexible molds! Quick drying! Safe! For home. classroom. or industry! Quart $2.00. Gallon $5.95. Full instructions! Beginners booklet on molding and plaster casting 25c. Free with order! Plastercraft Supply Company. 1406 East 43rd Street. Cleveland 3. Ohio.

COLORADO and Wyoming's fabulous oil boom spawning new millionaires. You too want shot at $1.000—$5.000—$20.000 on investment of only $140? New high price of $2.65 per barrel for oil setting people crazy. Write me today—not tomorrow for details. I'll attend to everything while you stay home. Dyer-PS. 1835 Champa Street. Denver. Colorado.

MAKE profits in mail order business. Astounding plans describing method sent free. Jimton Service. Lock Box 1373R. Mobile 8. Ala.

START Electrifying Sewing Machines: Free Details. Pasaak's. Box 153-S Canal Station. New York 13.

DO You Have a desire to work in Alaska? What do you want to know? Complete and satisfactory details for $1.00. We give personal attention to every inquiry. No Pamphlets. circulars or misrepresentation. Get your information from an Alaskan. Write: James Duncan. Box 1326. Ketchikan. Alaska.

BRONZING baby shoes is big business—start your own business for $3.95—Everything furnished. Metalsealed. Box 2095. Wichita. Kansas.

BEAT High Cost of Living. Be a vending machine operator. We sell coin-operated electric cigarette—candy—popcorn—juke box—slot and peanut machines. Write Cameo Vending Service. Dept. P.S.. 432 West 42nd St.. New York City.

GET it for them wholesale. Be community buyer nationally advertised merchandise; radios. refrigerators. washers. sweepers. typewriters. etc. Savings to 50%. This pleasant easy work can earn $5.000 year. Free information. Cox. 14 Church. Saugus 8. Massachusetts.

LIQUID Marble—Colorful. glossy! Molded. brushed. sprayed! Cast novelties. Statuary. colored tiles. Flexible molds. Composition floors. Particulars free. Marbleizing Service. Edwardsville. Illinois.

BOOKKEEPING Service Bulletin lists and evaluates available systems. Free. Consultants. Box #33. Forest Hills. N. Y.

LEARN Piano Tuning. Repairing. at home. Tremendous field! Piano parts. tools furnished. Established 1935. Empire School of Piano Tuning. 606-A East University Ave.. Champaign. Ill.

GET 400 money making ideas. Formulas. Plans. Schemes. Folio free. Formico Prod.. Box 572. Dayton. Ohio.

OWN Your own Dry Cleaning Business For as Low as $3200.00. For Information. Write Triplex Industries. Inc.. 3601 South Racine Avenue. Chicago 9. Illinois.

WOULD you pay 3%—first $350 made? Color-illustrated book "505 Odd. Successful Enterprises" free! Some offer occasional "day off." Work home. Expect something odd! Pacific. Oceanside. Calif.

Copyrighted material

METALLIZE baby shoes. Excellent profits. New system assures success. Free details. Treasures Forever. 89 Henry Ave.. Lynn. Mass.

NATURAL molding latex. Extra thick. Free Sample. W. Wooley. 115-B Donald. Peoria. Illinois.

EARN yourself one dollar an hour with my plan. Nothing to sell. For more information write to Chester Gottschalk. 1020 W. Broad St.. Quakertown. Penna.

METALIZE Baby Shoes. Make Rubber Stamps. Silver Mirrors. Make Plaster Novelties. Catalogue of "20 Ideas" Free. Universal. Box 1076-B. Peoria. Ill.

RUBACREAM! Natural Rubber Latex! Makes molds quicker! Thicker! Free Sample convinces! Castcraft Studios. 509-S Fifth Avenue. New York 17.

MEN and women wanted to place self-selling coin machines in stores. hotels. filling stations. etc. New machine earns up to $6.00 weekly—costs only $10.50. We furnish supplies and machines for nuts. gum. candy. stamps. scales and amusements. Free details of tested selling plan. Write Dept. Z. Parkway Machine Corp.. 623 W. North Ave.. Baltimore 17. Md.

MORE Money — easier! Revolutionary new method makes public bookkeeping an easy interesting way to earn $5.00 to $10.00 hourly. full or spare time. Simple. complete instructions! Start earning after 30 days. Success-revealing booklet free! 4513-G Sunset. Los Angeles 27. Independent Bookkeepers Society.

ENVELOPES addressed accurately. reasonably. Fast Service. We have capable addressers in your city. Glenway System. 5713-Z Euclid. Cleveland 3. Ohio.

BABY Shoes preserved. Formulas. Instructions $1.00. Supplies & Bases. Novelty Bronzing. Box 56. Hyde Park 35. Mass.

BIG Money in "Kitty-Kat" baby shoes. Complete mail plan No-Co-Ro. Oakland GS. California.

WANTED: Mail order propositions. Investment available. J. F. Smith. R. D. 3. Baldwinsville. N. Y.

INCOME from local information. No selling. Neher Company. La Verne 6. California.

MAKE money repairing clocks. Details. Jones. 121OS Dudley. Utica. N. Y.

LEARN how to publicize yourself for greater personal income and rapid advancement. Details free. Publicity Systems. Box 322-B. Jacksonville. Illinois.

WATCHES. wholesale: Rebuilt Elgins. Walthams. Bulovas. etc.. new and used railroad. diamond. rhinestone. lapel. $9.50 up. Catalogue free. Brookings. B-Z1975. Little Rock. Ark.

"OPPORTUNITIES for you in modern Electroplating." Free. illustrated booklet. Write Joseph B. Kushner. Metal Finishing Consultant. Stroudsburg 9. Pennsylvania.

TIPS. Unusual. profitable occupations requiring minimum capital. Monthly bulletins. Subscription $1.00 yr. Roving Reporter. 3361 Cahuenga. Hollywood 28. California.

"PLIASTONE"—New building material. Resurfaces old homes. build new ones. Composition floors; colored tile. Particulars free. Marbleized Service. Edwardsville. Illinois.

ELECTROPLATE on leather. plastics or metal. Instructions $1.50. Four ampere plating unit with instructions $19.95. Eight ampere unit $29.95. Kissel Electric Products. 431 Sherman. Galion. Ohio.

NEW Liquid plastic. Earns money for you at home. Make plastic containers for the drug and cosmetic trade. Terrific demand. You make them. we sell them. You can earn a minimum of $50.00 per week at home. No machinery or experience required. We supply raw materials and instructions; or you can come to our laboratories and receive personal instruction and contract. Write for full details. Travaco Laboratories. P. O. Box 1883. Boston 5. Mass.

BUYERS Wanted for plaster novelties and religious statuary. Painted—unpainted. retail—wholesale. Write today for free information. Bing Products. 88-B6A Broad. Boston 10. Mass.

"MANY Real opportunities especially Chile. Ecuador. Peru. Bolivia." "Forward $1.00 registered airmail. Receive full accurate advice." Morgens. Casilla 5024. Santiago III. Chile SA."

GET Hundreds Money Making Deals. business ideas. plans and manufacturing. Amazing folio free. Austin Mail Service. 5538 Lexington. Chicago. Ill.

MACHINES available for making new designs of interlocking concrete building blocks. Delaware Industries. Dept. 21. Muncie. Indiana.

SELL!! Balloons. Combs. Specialty Merchandise. Carleton House. Distributors. Texas City. Texas.

MAIL order business your opportunity. "How To Build Your Own Mail Order Business." Beginner's idea-book tells how. Quarter, postpaid. Satisfaction warranted. Gilchrist. 622-S. Mass. Ave.. N.E.. Washington 2. D. C.

MAILING postcards selling repeat merchandise is profitable. Everything supplied. Details free. Gordon Publishers. Box 23. Pawtucket. R. I.

$46 FROM Square Foot Plywood; Jigsaw necessary. Write; Woodart. Bridgewater. Massachusetts.

START Mailorder Bookshop—Everything furnished. 25c brings booklet. samples. exciting ideas. General Publications. Ossining 1. N.Y.

PRESERVE baby shoes. Gold. Silver Bronze. Instructions $1.00. Johnson. 2611 Harriet. Minneapolis 8. Minnesota.

UNPAINTED figurines. Wholesale. retail. Plastercraft. 643-E Canada. St. Paul 1 Minnesota.

MOLD Makers. Genuine natural latex for rubber molds. only two coats needed for thick mold. Reproduce statuary. plaques. Inexpensive. Write Major Chemical Co.. 131A Inman Street. Cambridge 39. Mass.

WANTED 200 operators all states except Maryland. Latest method advertising nationally. Enclose stamp. Harrison Ayres. Edgewood. Maryland.

GOODYEAR—Has natural Malaya 75% heavy brushing rubber for molds. Write full particulars. trial pint $1.50. Goodyear. Lake Geneva. Wis.

$108.00 EARNED weekly. Guaranteed method. Send $2 deposit. Lipak. 2066 E. 77th St.. Cleveland. Ohio.

CIVIL Service offers permanent employment. promotions. vacations. sick leave. pensions. Can private industry offer you this? Public Service Institute. 1310 North 45th Street. Seattle 3. Washington.

WHOLESALE vitamins. minerals. concentrates. health books. National Products. Portland 2. Oregon.

POTTERY—Made without molds! Selfhardening. no firing. Gorgeous colors. Bird baths. wishing wells. benches. cemetery products. Particulars free. Rapid Pottery System. Edwardsville. Illinois.

AMAZE others. Add columns instantly. Add faster than adding machine. Free details. Maths Institute. Box 463. Nashville 2. Tenn.

MAIL Order businesses. bought. sold. brokered. Write for Free bulletin of exclusive opportunities. Turnipseed. Inc.. Box 681. St. Louis. Mo.

AMAZING values. remnants rayon housewife buy on sight. Write B & M Textiles. 78 No. Main St.. Peterson. N. J.

MONEY for you in your own business. Many surprising opportunities. Free information. Empire. Box 1340-B. St. Louis. Mo.

SAVE! Million articles wholesale. Directory 10c. Publishers. Box 1302-A6. Detroit 31.

57 MONEY MAKING OPPORTUNITIES

21 POPCORN. Candy Apple. etc. Formulas. All money-makers. $1.00. We can supply equipment. Concessions Supply Co.. Dept. "B". Box 133 Sta. "B". Toledo. Ohio.

MANUFACTURE costume jewelry at home for profit. hobby. therapy. Free wholesale supply catalogue. Instructions. Florida Supply House. Bradenton. Florida.

DETECTIVES Earn Big Money. Experience unnecessary. Particulars free. Wagoner. P-125. West 86th. N. Y.. N. Y.

METALLIZE baby shoes. Further information — 3c stamp. Metal Crafts. Box 125-R5. Tampa 4. Florida.

LATEST Money-making opportunities. Variety of choice. Details free. Edward Stevens. 716 W. 4th St.. Michigan City. Indiana.

TECHNICAL bulletin listing. 24 Opportunities. Free. Public Educational Service. 493 Irving. Bridgeton. N. J.

I EARN $5 to $25 hourly doing bookkeeping. Secrets worth thousands to You; only $10.00. Bookkeeping. Box 1533. Albany. N. Y.

WIN contest money. General Contest Magazine gives hundreds of tips. Lists current contests and rules. Sample 25c. General Contests. 1609-A East 5th. Duluth. Minn.

PRIZE Contest Fans Reap Rich Rewards. Enclose 3c stamp. National Contest Bulletin. Box 2685-S. Miami 31. Fla.

EXTRA Money? Particulars Free. J & S Service. 1216 Park Row. New York 7. N. Y.

WOULD You pay 3%—first $350 made? Color-illustrated book "505 Odd. Successful Enterprises" free. Expect something odd! Pacific. Oceanside. California.

MAKE $5000 yearly "Cashing-in on Fluorescent lighting." Start profitable maintenance and fixture fix-it business without capital. Make beautiful lights (Complete) for 50c each and less. Hurry for amazing illustrated literature and sensational free-gift offer. Willis Service. 101 York Street. Brooklyn 1. New York. Dept. A.

RECEIVE steady stream mails. magazines. moneymaking offers. Varren. Freeland. Mich.

LATEST money making homework plans. Write Kearns. 15221-A Kinsman. Cleveland 20. Ohio.

SAWDUST. Turn it into cash. Six methods. Instructions 25c. Charles. 12-EP. Norwood. Ohio.

FREE Illustrated list beautiful design. Unpainted plaster ornaments easily decorated with water colors or oil paint. Mid West Novelty Mfg. Co.. 108B Cedar. Anaconda. Mont.

ANALYZE handwriting for profit! Complete outfit $1.00. Graphologic. POB-971. Philadelphia.

OPERATE Profitable mail order business. Splendid opportunity. For details write Royal Service. 203 Cameron St.. Alexandria. Va.

REPAIR Leaking faucets easily with our repairing kit. Write for details. Great Lakes Metal Specialty Mfg. Co.. 1450 North Ave.. Chicago 22. Ill.

START your own business! Big money manufacturing novelties. plaques. statuary. Free catalog. Write Bing Products. 68-B6B Broad Street. Boston 10. Mass.

WIN Contest money. send 25c guaranteed instructions for writing winning answers. Winacontest. 22 Westlake Ave.. Auburn. New York.

EXCELLENT permanent job opportunities for U. S. citizens. Wages 20% higher. less taxation. lower living costs. Improved Social position. Transportation and housing furnished. Latin America and Far East. Send $1.00 for copyrighted digest showing oil. shipping construction. etc.. companies working and hiring. Includes sample application letter. etc. World Wide Company. Dept. S. Madison 1. Wisconsin.

EARN money evenings. copying and duplicating comic cartoons for advertisers. Adservice. Argyle 2. Wisconsin.

58 FORMULAS, PLANS, ETC.

10.000 FORMULAS and Trade Secrets. Free Literature. Stillmans. 555 Kingston Ave.. Brooklyn 3. N. Y.

FORMULAS for twenty-five useful products. One Dollar. Chemist. Box 274. West De Pere. Wisconsin.

400 MONEY Making Deals. Formulas. Mfg. secrets. Tips. Folio Free. Formico-NA. Box 572. Dayton. Ohio.

AMAZING water softener. Inexpensive new powder triples suds of soap. Doubles detergency. Won't chap hands. Formula Two Dollars. J. Dick. P. O. Box 1322. Indianapolis.

LABORATORY tested formulas. Lists free. Pont. Box 635-PS. Terre Haute. Indiana.

ICELESS Ice! Colder. Cleaner. Cheaper. Instructions. 25c. Duffy. Covington 5. Ky.

59 PLASTICS

LUCITE. Plexiglass. All size sheets. Cost square foot (12 x 12) 1/16" 90c; 1/8" $1.16; 3/16" $1.43; 1/4" $1.68; 5/16" $2.09. Include 10% postage. Almac Plastics. 230 5th Ave.. New York 1. New York.

Copyrighted material

PLASTIC—Sheets, Rods, Tubes, etc. Free List. Plastic Supply Co., 2618 St. Louis Avenue, St. Louis 6, Mo.

PLASTIC Hobbiest Special. Plexiglas & Lucite scraps from salvaged airplanes. $4.00 for 5 lb., more than 8 sq. ft., irregular pieces, assorted thickness 1/16" to ¾". Send money with order. Postpaid in U. S. Ivan Ogden, P. O. Box 1564, Sacramento 7, Calif.

PLASTICS Trade Secrets—Write for free information. Plastics Research, Box 346, Alhambra, Calif.

PLASTICS—Sheets, rods, tubes; dyes. Plastic coatings. Shells, findings, craft supplies. Lucite scrap, 25c pound up. Illustrated fabricating manual, price list, 10c. Lucite sample, 35c. Courtesy to dealers. Gem-O'-Lite, 5350G Riverton, North Hollywood, California.

INTERNAL carved wild-life pins $1.50. Rose costume jewelry sets $1.75. Crystal Floral Novelty Co., Somerville, New Jersey.

AMAZING liquid plastic pours without heat. Beautiful castings within half hour. Clear, colors. Embed photographs, coins, flowers, keepsakes. Complete kit $2.90 (U.S.A.) Kristalon Plastics, Dept. B-6, Box 29, Wilmette, Ill.

INTERNAL Carved swans, bluebirds, goldfish, butterflies, etc., pins, $1.50. Rose or Daisy costume jewelry sets, $1.50 less findings. Also gifts and novelties. Crystal Floral Novelty Co., Somerville, New Jersey.

INTERESTED in new ideas in plastics? Information Free. Designers Group, Box 363, Pleastantville, New Jersey.

WEIRD Silicone Plastic—it Bounces—Flows like Liquid—$1.00. White, 8526-3rd Ave., Brooklyn, N. Y.

60 CHEMICALS AND APPARATUS

LUMINOUS Paints will glow in dark. Six colors. Fairmount Chemical Co., 136 Liberty St., New York City 6.

LEARN Chemistry at home, from the House of Winn. Home of Supplies for student Chemists. New idea chemical and apparatus outfits for Home Experimenting. Photographic Scales. Semi-Professional Microscopes and accessories. Send 10c for retail catalogue. Established 1931. John H. Winn, Dept. 606, 124B West 23rd Street, New York 11, N. Y.

SINKER molds for making your own sinkers. Several styles, many sizes. Free illustrated folder. Reading Instrument Co., Box 78, Reading, Pa.

FREE catalog: Chemistry, Mineralogy, Biology, Physics. Tracey Laboratories, Evanston, Illinois.

INTERESTING Catalogue Rare Elements. Chemicals small quantities, processes. Dime refunded first order. Vicar Laboratories. Established 1916. Guerneville, California.

CHEMICALS and apparatus for industrial, analytical, and private laboratories. Complete supply service for correspondence school students. Send 10c for catalog. Dept. M-26, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 7, N. Y.

SWISS Businessman seeks connection with manufacturers of interesting ultramodern articles, for export to Switzerland. Please address offers to: "Technical News", Postcase 119, Thun, (Switzerland).

COMPLETE Supply Catalog, 10c. Pilgrim Chemical, 348-GG Edith, Salt Lake City 4, Utah.

ENJOY Educational recreation with a home laboratory. Catalogue of Chemicals and Apparatus 15c. Microscopic stains and preparations 20c. Both 25c. National Scientific Company. Established 1908. 2204 W. North Ave., Chicago 47, Ill.

APPARATUS, chemicals, ounce quantities, catalog 10c. Fleischer's Laboratories, Everett 49, Mass.

61 HELP WANTED

"ALASKA—The Last Frontier" offers unlimited opportunities. $1.00 brings official government map & copyrighted report with Fish & Game rules, listing fishing, construction, mining, aviation companies, homestead and Alaskan Highway information. Alaska Opportunist, Dept. PS, P. O. Box 883, Hollywood 28, Calif.

EARN Up To $520 Month part or full time keeping books for small firms. Simplified System. Write Tax-Saver System, Dept. R, Fort Worth, Texas.

INTERESTED in Latin American & Foreign employment??? $1.00 brings 1948 Copyrighted Foreign Service Directory listing firms interested in oil, construction, mining, aviation, exports & imports. How-when-where to apply. Hot list of companies hiring. Global Reports, Dept. PS, P. O. Box 883, Hollywood 28, Calif.

BOYS Wanted. Over $50 week! Sell name plates for front doors. Write National, 214-DD Summer, Boston, Mass.

FOREIGN Employment! List of 150 companies with foreign interests $1.00 or C.O.D. Foreign Service Institute, Box 3934 J Miami 24, Fla.

PENCILS Advertising & Office Full or part time. Excellent commission. Protected territory. Universal Graphite Pencil Co., Dept. B, Clinton, New Jersey.

62 AGENTS WANTED

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late method. No tanks or shop required, outfit furnished. Free Booklet. Gunmetal Co., Ave. G, Decatur, Illinois.

EXCELLENT Sideline for printing and advertising salesmen. Decalcomania name plates in small quantities. Great demand. Also, make money with our line of Automobile Initials and Sign Letters. Free Samples. "Ralco", XL-Roxbury, Boston 19, Mass.

SELL Delicious Candies, Nuts, Gum. Immediate delivery. Write Casterline, 2031-SJ Sunnyside, Chicago 25, Ill.

AGENTS—300% profit selling genuine gold window letters; stores and offices. Free samples. Metallic Letter Co., 437 N. Clark, Chicago.

JOBS Open In Selling! Send name, address for Free copy Opportunity Magazine, listing hundreds of companies who need men now, full or spare time. Experience not essential. Opportunity, 28 E. Jackson, Dept. 15, Chicago 4, Ill.

FREE Sample! Big profit opportunity with amazing Glow-In-The-Dark house number, switch plates, pictures, decals, religious articles. Represent large manufacturer. Madison Mills, 303 4th Ave., New York, N. Y.

RESTAURANT Salesmen—New fast selling sideline that nets 200%. Sample free. Theron Fox, 1296A Yosemite Ave., San Jose 11, Calif.

BIG Money Quickly and Easily taking orders for complete line Personalized Initialed Buckles, Belts, Cap Badges, 2,000 Emblems. Fast repeats. Write today. Hook-Fast Company, Box 480-PS, Roanoke, Virginia.

MAKE more money selling personal initialed individualized belts, buckles, cap badges, tie holders, name plates, 2,000 emblems to choose. Big profits, whole or part time. Write today—special outfit order. Hookfast Specialties, Box 1425, Dept. 7, Providence, Rhode Island.

GUARANTEED product in protected territory, if you are now selling or intend to sell house-to-house. For full 1 Qt. Sample amazing High Shine Windsor No Rubbing Wax, send only 25c covering handling and postage. (Sells for $1.25). Windsor Wax Co., Inc., Dept. P.S.-2, Hoboken, N. J.

SELL new, used clothing from home, auto, store. Wholesale catalog Free. Calumet Sales, 4719 Kennedy Ave., East Chicago, Indiana.

$1 STARTS you in business. Sell DeLuxe ties. 100% wool interlining. Costs you only $7 per dozen, you make $5.00 dozen. Send $1.00 for special introductory offer two DeLuxe ties. Catalog complete line Free. Philip's Neckwear, 20 West 22nd St., Dept. P-23, New York 10.

GOLD lacquered Window Sign Letters. Large Sizes Penny Each. New Foils. Absolutely Beautiful. Free Samples. Atlas, 544 W. 79th, Chicago 20.

AMAZING Possibilities. Exclusive religious specialties. Colonel Smith, 1211 Chestnut, Room 603-C, Phila. 7, Pa.

AMAZING "Shampoo" Auto Washer. New Invention. Lightning seller. Automobiles gleam like mirror. Samples sent on trial. Kristee 123, Akron, Ohio.

NO Summer Slump in magazine sales! Make money year 'round taking new renewal orders from neighbors, friends. Helps Furnished. Free catalog. Write McGregor Magazine Agency, Dept. 13, Mount Morris, Illinois.

FREE nylons given if Kendex hosiery runs or snags! World's only women's hosiery sold with a written guarantee that amazes everybody. Mere words could not possibly express the almost unbelievable opportunity you now have to make money. Fantastic and "impossible" earnings now become a reality. Can you imagine a guarantee that replaces hosiery regardless if damage is due to use or abuse and regardless whether it is the fault of the hose or the wearer? Here is sales dynamite that will blast your earnings to the sky! Even if you never sold a thing in your life, three magic words: "Guaranteed Against Everything" will open doors for you—will make women listen and will pour money in your pocket. Kendex stockings are not sold in stores, so you have no competition. Complete line includes beautiful sheer nylons; long wearing, durable service nylons; three different lengths; genuine outsize nylons; latest shades; choice of full fashioned with seams or seamless; lowest priced rayons. Also separate complete line of men's hosiery including nylon, lisle, rayon, cotton, mixtures, etc.; plain and fancy; long and short. Thousands of pairs shipped daily. No money or experience needed. Nothing to invest or risk. No samples to buy. Nothing to pay, now or later! Simply write orders. We deliver and collect. Liberal advance cash plus huge cash bonus. Write orders spare or full time; exclusively or as a side line. Become a manager and appoint others to sell for you with steady income on their sales! Complete money-making outfit, including sales books in colors, samples cut from actual hose, instructions, order blanks, etc. furnished free and prepaid. Rush name and address on postcard and start making money next week. Kendex Co., Babyon 146, N. Y.

AGENTS for Educational Institution NYC area; liberal commission; no investment. Box 686, Journal Square Station, Jersey City 6, N. J.

SELL Gold embossed monogram stationery. Sample Free. Dunbars, Sanford, Florida.

SALESMAN: $20 to $30 a day easy. Sensational new Raised Letter Metal Nameplate, beautifully framed in Mahogany. Amazing seller to homes, stores, offices, etc. No deliveries. Get our tested plan. Write Raised Letter Metal Co., Dept. 2278, Fox Bldg., Philadelphia 3, Pa.

MEN-Women. New sensational floor Mop. So clean to use women can wash floors in evening gown. No Splash or drip. Magic Mop, 8427 So. Chicago, Dept. PS, Chicago.

NEW — Fast selling adhesive — Every home a prospect—Good repeat business—Prove it to yourself—Send 50c for generous $1.50 size bottle. Stickum, 481 S. High St., Columbus, Ohio.

ADVERTISING book matches—Cash in on Political campaigns—sell Union Label matches. Cuts for all businesses and political parties—Free powerhouse selling kit—low prices—protection guaranteed on repeat orders—Cash commissions. Superior Match Co., Dept. P-68, 7530 Greenwood, Chicago.

AGENTS Wanted for our Slot Machines and coin operated amusement games in every town and community. Sell to clubs and homes, or start a route. Webb Distributing Co., Dept. P40, 6 So. Kedzie Ave., Chicago 12, Ill.

POCKET Pal: Replaces Pocket Knives. New, Safe, Beautiful. Always razor sharp. 50c seller. 231% profit. $15.00 or more daily. Agents, Salesmen, Distributors. Sample 10c. Nelson Mfg. Co., 222 W. Kellogg, St. Paul 2, Minn.

SILVERWARE cleaning, plating, polishing, liquid (NuSilver). Apply with cloth. Contains genuine silver. Renews silverplated ware, articles, pieces. Silverplates brass, copper, bronze. Part, Full-time, agents wanted. NuProcess Products, Aurora, Ill.

EARN Big Money Year 'round. Be a one-person-department-store. Take orders for shirts, ties, hosiery, lingerie, Household linens, etc. For information Corporative Merchandisers, Dept. PS3, 110 West 34th Street, N.Y.C. 1.

CHRISTMAS Card Bargains, Personalized Napkins, Book Matches, Playing Cards, Pencils. Raum, 4154-B Fifth Street, Philadelphia 40.

"HOW To Win Prize Contests" Booklet $1.00; $4.80 dozen. Box 28EPS, Jackson Heights, New York.

Copyrighted material

SELL—Hand-woven felt scatter rugs. Fast moving. Good Profit. Write Max Gill & Son. Haverhill. Mass.

INFORMATION — Wholesale supply sources. Moneymaking plans. Increase your income. Write Reynard Station. Smithfield 3. Ohio.

POWER Lawn Mower (Maytag)—$99.50. Sales kit—Free. Rotacut. M-2106. Springs. Missouri.

LADIES' Handbags $5.50 Retails $12.50. Caspy. 239 Dumont Ave.. Brooklyn 12. N.Y.

WOULD you pay 3%—first $350 made? Color-illustrated book "505 Odd Successful Enterprises" free! Proven! Work at home. office. Expect something odd! Pacific. Oceanside. California.

AMAZING invention. Needed by thousands. 500% profit. Send quarter for samples full details. Refundable. Krueger. Box 812-S. Oakland 4. Calif.

SELL ultra-blue stock signs to stores. 1000 slogans. comedy. general. religious. "7x11" cost 6c—Sells 35c—Make money. 15 samples Ultra-blue signs "7x11"—$1.00 postpaid. L. Lowy. 8 West Broadway. Dept. 390. New York City 7.

SELL leading phonograph records. radios. appliances. part time. Talent Packages. 55 West 42nd. New York 18.

AUTOMOTIVE Shop Distributors. write us. New money-making product. Northlakeco. Peoria 4. Ill.

HOT jobbers prices on 200 fast selling items. Kittrell Company. Waterloo. Iowa.

MAKE Sensational profits! New. sell-on-sight Plastic line: Tablecloths. aprons; many other splendid fast-selling items. novelties. Postal brings free details. special deals. Hurry! Royalty. Box-L-748. Passaic. N. J.

AMAZING big money-maker. Water proof tablecovers. food covers. aprons. twenty other terrific sellers. Postal card brings free selling equipment. Star 261-P. Fifth Ave.. New York.

SENSATIONAL new discovery. Ink-N-Trol ball pen with priming piston. Cannot stop writing. guaranteed. Dollar Distributors. Box 26. Morris Hgts. Sta.. New York 53.

FREE water and our concentrates make flavors. lotions. shampoos. 72 products. Labels. bottles furnished. Qualco. F-20030 Russell. Detroit.

BIG Profits. Sell outstanding photo enlargements. Photorich. 215 W. 98th. New York 25.

DISTRIBUTORS—Increase your income! Wholesale supply sources. Moneymaking plans. Write Bowden Service. Box 0673. Toledo. Ohio.

$3 FIRE Extinguisher sells wholesale or direct. "Fire-Killer". 101 Franklin. Syracuse 1. New York.

BLADES—Carded goods—Sundries—list free. Colemanco. 191 Harral Avenue. Bridgeport. Conn.

63 HIGHGRADE SALESMEN

START Your own business on our capital. Always your own boss. Hundreds average $6.000 to $25.000 annual sales year after year. We supply stocks. equipment on credit. 200 home necessities. Selling experience unnecessary to start. Wonderful opportunity to own pleasant. profitable business backed by world-wide industry. Write Rawleigh's. Dept. F-U-PSC. Freeport. Ill.

FANS—Fans—Salesmen making $50 to $100 per day selling our Electric Fans. Sump Pumps and Portable Water Softeners. Have also. all kinds of fan parts; build your own. Write Universal Fan Co.. Peru. Ind.

BIG Money Taking Orders: Shirts. Ties. Sox. Pants. jackets. sweaters. shoes. uniforms. etc. Sales equipment free. Experience unnecessary. Nimrod. 4922-AV Lincoln. Chicago.

EARN $25 a day and more selling nationally advertised aluminumware. silverware. pressure cookers and jewelry. It is simple. let us show you how to make big profits with no investment. Write Continental Products. Dept. C6. 30 Ormsbee Avenue. Providence. R. I.

SALESMAN—Put yourself in line for big money and real future. Keep stores supplied with 5c—10c counter goods. Nationally advertised merchandise. Top profits for you and merchants. Liberal deals boost sales. Sideline or full time. World's Products. Dept. 83-D. Spencer. Ind.

SALESMEN—sell calendars. adv. novelties. Season on. Buyers everywhere. Low Prices. Big Commissions Advanced. Bonuses. Samples free. Consolidated-Modern Press. 329-C So. Wood. Chicago 12.

NEW Opportunity—Earn Big Profits. Mailing and shipping cartons are used in every business. Salesmen-Saleswomen. we will help you make easy sales. steady commissions on quickly repeating orders. $1.00 good faith deposit brings sales kit. Corrugated Paper Products. Inc.. 617 Brooklyn Ave.. Brooklyn 3. N. Y.

$240.49 IN ONE week—Unusual? Not at all! Just look at one week's earnings of these representatives. WWS $290.99. JMH $229.75. RJR $262.47. VJM $275.95. JEA $240.49. RWF $231.21. Direct mail campaign brings hot leads right into your home. Remarkable product does part of 10 men's work—a "natural" during these labor problem days. Has perfect sales story —sells year 'round. As modern as Radar! Special demonstrator offer. We extend credit. deliver and collect. No capital required—no experience necessary. You make big profit on first sale and full credit on repeat business. Every business. store. factory. etc.. are prospects. Write John Porter. 2433 Indiana. Dept. 332. Chicago 16.

67 EDUCATIONAL AND INSTRUCTION

ENJOY yourself make friends with Magic 40 tricks $1.00. Magic Package 25c. Lindhorst. 612 E. Pine. St. Louis. Mo.

HAVE your own office! Many earn up to $5,000-$15,000 Annually. Learn credit-collection agency business by home study course. Experience unnecessary. Write for Free bulletin. No obligation. Franklin Credit School. Dept. 203-F. Roanoke 7. Va.

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week" Bookkeeping and Tax Service. Full or Spare time. Details Free. No obligation. Ellis. Box 203. Cedar Grove. North Carolina.

BECOME a Doctor of Psychology or Metaphysics. Teach secret of contentment. happiness. Win degree of PsD. or MsD. Solve mental worries. Free book. College of Universal Truth. 5153-K N. Clark. Chicago.

PIANO tuners are in demand making big money. Learn piano tuning at home. Write Evansville School of Piano Tuning. Dept. C. 714 S.E. Second Street. Evansville. Ind.

WHY Don't You Write? Writing short stories. articles. etc.. will enable you to earn extra money. In your spare time we teach you to write the way newspaper men learn—by writing. Free "Writing Aptitude Test" tells whether you possess the fundamental qualities essential to successful writing. Veterans! This course approved for Veterans Training. Write today! Newspaper Institute of America. Suite 5668-H. One Park Ave.. New York 16. N. Y.

SPEED and Skill in Radio Code to qualify for Amateur of Commercial Radiotelegraph License. Learn at home with the famous Candler System used to train radiotelegraph experts and champions. Good pay or fascinating and profitable hobby. Free Book. Candler. Dept. 6-G. Box 928. Denver. Colorado.

PAINT Beautiful pictures quickly. easily. Inexpensively. Free literature. Art Book Shop. Arnold 6. Mo.

LEARN Piano Tuning. Prepare for Career in fascinating profession. $5.000 year easily earned. Real security. pleasant easy work. No profession Paying so well can be mastered so quickly. Natural Aptitude. desire to get ahead chief requirements. Prospectus and full information on request. Harmony School of Piano Tuning. Box 582. Harrisburg. Pa.

VALUABLE information on your memory; famous feats of memory; Supermemory; free. Write today. Thor Books. CS-6. Box 1210. Chicago.

LEARN to dance from Nature—man's first teacher! Results guaranteed! $2.00. Silvers Publications. 804 5th Avenue. Youngstown. Ohio.

USED Correspondence Courses and Educational Books. Bought. Sold. Rented. Catalog Free. Educational Exchange. Summerville. Ga.

MEDICAL Laboratory Technicians in great demand. We train you in your own home. in your spare time. Also home study course in General Chemistry. Catalogue free. Imperial Technical Institute. Box 973-S. Austin. Texas.

BOOKKEEPING doubled my income! Three hours interesting reading teaches Bookkeeping completely. Auditax System. 4513-I Sunset. Los Angeles 27.

LEARN typewriter repairing under G.I. Bill. Adding machine and Calculator courses available. For information write Dept. PS-6. Capitol School of Typewriter Mechanics. 1328 New York Avenue. N.W.. Washington. D. C.

NON-RESIDENT courses high school. college. business. 37th year bulletin. Capital City College. Washington 5.

BIBLE Correspondence course free. six languages. Victory Service. Emmaus. Penna.

STUDY Real Estate. Write DeVoto Schools. 35 Vincente. San Francisco 16. Calif.

AMAZE others. Add columns instantly. Add faster than adding machine. Free details. Maths Institute. Box 463. Nashville 2. Tenn.

69 CONTESTS

$1.000.000 FREE—Yearly—Contests. Win fortune. We prepare entries—lowest cost. Write. Research. 13 Earl Street. Red Bank. New Jersey.

WIN contest prizes. cash! "Here's How." Alfred Novak. 2601-S. Division. Cleveland 13. Ohio.

70 LANGUAGE OUTFITS

LINGUAPHONE Makes Languages Easy at home. Learn to speak Spanish. Portuguese. Italian. French. German. Russian. by quick. easy Linguaphone conversational method. Save time. work. money. Linguaphone Correspondence Courses are available to veterans under G.I. Bill of Rights. Send for free book. State if G.I. Linguaphone Institute. 54 RCA Bldg.. New York 20. N. Y.

72 AUTHORS SERVICE

I WANT New Writers to cash hundreds of checks for $1 to $100. offered each month. The easiest way to write for pay. No previous experience necessary. Send for Free details. No obligation. Saunders M. Cummings. 467-S Independence Bldg.. Colorado Springs. Colo.

73 BUSINESS SERVICE

COMPLETE container service for mail order trade. Request folder. Corrugated Paper Products. Inc.. 617 Brooklyn Ave.. Brooklyn 3. N. Y.

74 CARTOONING, SIGN PAINTING, DRAWING AIDS

"HOW To Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is Free: no obligation. Simply address Cartoonists' Exchange. Dept. 196-C. Pleasant Hill. Ohio.

9 ALPHABET 3 Numeral Pattern Sets and Catalog $1.00. Sign Letter Distributors. P. O. Box 101. Mineola. N. Y.

"CARTOONS and drawing." 31 lessons. $1.00 (refunded). Catalogs. 10c. Stone. Luenburg 30. Mass.

SIGNS made easily. Instructions and ten sets modern alphabets. numerals. patterns. Sizes up to eight inches. All for $1.00. Co-operative Business. 7 West Madison. Chicago (2).

SIGN painting taught at home by an old master. Ben Kerns. Box 812. Greenville. S. C.

PAINT Beautiful pictures quickly. easily. Inexpensively. Free literature. Art Book Shop. Arnold 6. Mo.

75 CHALK TALK-STUNTS

CHALK Talks. Laugh Producing Program. $1.00. Illustrated Catalog 10c. Cartoonist Balda. Oshkosh. Wisconsin.

76 TYPEWRITERS

RECONDITIONED Typewriters. Printing Devices. Office Appliances. Supplies. Dixiegraph. King. N. C.

78 RUBBER STAMPS

DELUXE Cushioned. indexed. knob handle; Three lines $1.00. two 75c. Quick Service. Catalog 10c. Warner Stationary. Box P-43. Havre de Grace. Maryland.

RUBBER stamps. Illustrated literature free. Lee-Vall Press. Dept. 4-D. Box 1242. Indianapolis 6. Indiana.

3 LINES. Cushioned. indexed. 50c. Signatures $1.95. Printright. Wauwatosa. Wis.

Copyrighted material

79 PRINTING OUTFITS, SUPPLIES

"PRINTOMATIC" Self-feeding Post Card Stencil Printing Duplicators $9.50 Up. Office Size Duplicators, Speedoprints, Hilcos, Excellographs $33.41 Up. Literature Free. Pittsburgh Typewriter Supply, 336 WE Fourth Ave., Pittsburgh 22, Pa.

PRINTING Presses. Type Supplies. Lists 3c. Turnbaugh Service. Loysville. Penna.

PRINTING outfits, type. Send dime for illustrated supply book. Kelsey A-8. Meriden. Connecticut.

INEXPENSIVE home-made printing press. Details free. Novelty Shop, Downsville. Louisiana.

MULTIGRAPH machine at sacrifice—real bargain. George Wentz. San Marcos. Texas.

MAKE your own printing cuts. Newly invented plexiplate process. Plexiservice. Argyle 2. Wisconsin.

80 PRINTING, MULTIGRAPHING, ETC.

1,000 BUSINESS cards printed prepaid $2.50. Reliable Print Shop, 901 E. Jefferson. Louisville. Ky.

SELL Printing. Amazing Profit. Mango. 555-B South 20th. Newark 3. N. J.

SIXTY letterheads. forty envelopes. beautifully printed. $1.00. Calder's. Box 3422-PS. Phila. 22. Penna.

100 BUSINESS Cards. 75c Printed Prepaid. W. M. Davis. 935 Maxwell. Chicago 8.

SEND 10c Now. for our 48 page pricelist—Refunded first order. McCall Press (PSM). 1326 South 27th. Omaha 5. Nebr.

200 LETTERHEADS or envelopes $1.75 samples. Pierson's Press. Brevard 4. N. C.

WEDDING Announcements. Personal Stationery. Inexpensive. Printshop. 176-A Fourth. Leominster. Massachusetts.

PENCILS—Same imprint up to 45 characters. 2 dozen $1.00. 4 dozen $1.75. Cash postpaid James Virtue. 5303 Atlantic Ave.. Ventnor. N. J.

QUALITY Printing: Business. personal stationery. State requirements. Samples. Mero Products. 99 Morrison. Punxsutawney. Penna.

$50.00 WEEKLY income from Home Mimeograph Shop. Folio tells how. only $1.00. Mimeograph Service. Box 496. Russellville. Arkansas.

BUSINESS Stationery—100 full size letterheads. 100 envelopes. printed on best bond. Postpaid $3.00. Watson's. Latta. S. C.

82 PATENT ATTORNEYS

INVENTORS: Learn how to protect your invention. The United States Patent Office advises the inventor. unless familiar with such matters. to engage a competent registered patent attorney or agent to represent him. We maintain a staff of registered patent attorneys ready to serve you in the handling of your patent matters. Special booklet "Patent Guide for the Inventor" containing detailed information concerning patent procedure with "Record of Invention" form will be forwarded upon request —without obligation. Clarence A. O'Brien & Harvey Jacobson. Registered Patent Attorneys. 82B-D. District National Building. Washington. D. C.

INVENTORS. For "Record of Invention" form. contact Carl Miller. Registered Patent Attorney. Woolworth Building. New York.

INVENTORS: Write for free brochure "Evidence of Invention." Labiner, World Building. New York 7.

INVENTOR'S Guide free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7, N. Y.

INVENTORS: When you are satisfied that you have invented something of value write me. without obligation. for information as to what steps you should take to secure Patents or Trademarks. Write Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty.. 938 Columbian Bldg.. Washington (1). D. C.

C. A. Snow & Co.—S-427. Snow Building. Washington 1. D. C. Registered Patent Attorneys. Write for information.

INVENTORS—Send today for "Detailed Patent Information" outlining preliminary steps to be taken toward Patent Protection. also convenient "Evidence of Invention" form. Victor J. Evans & Co.. 341-F Merlin Building. Washington 6. D. C.

PATENT practice before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster. Allwine & Rommel. Registered Patent Attorneys. Suite 413. 815—15th St. N.W.. Washington 5. D. C.

INVENTORS: Without obligation. write for information explaining the steps you should take to secure a Patent. John N. Randolph. Registered Patent Attorney. 207 Columbian Bldg.. Washington 1. D. C.

PATENTS—Trade marks. Irving L. McCathran. 316 McLachlen Bldg.. Washington 1. D. C. Registered Patent Attorney.

INVENTORS — Patent Laws encourage the development of inventions. The Rules of Practice of the U.S. Patent Office advises —unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent. as the value of patents depends largely upon the skillful preparation of the specifications and claims. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorrow, Berman & Davidson. Registered Patent Attorneys. 1434 Victor Building. Washington 1. D. C.

83 FOR INVENTORS

INVENTORS: Learn how to protect your invention. The United States Patent Office advises the inventor. unless familiar with such matters. to engage a competent registered patent attorney or agent to represent him. We maintain a staff of registered patent attorneys ready to serve you in the handling of your patent matters. Special booklet "Patent Guide for the Inventor" containing detailed information concerning patent procedure with "Record of Invention" form will be forwarded upon request —without obligation. Clarence A. O'Brien & Harvey Jacobson. Registered Patent Attorneys. 82A-D District National Building. Washington. D. C.

"INVENTOR'S Guide" free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7, N. Y.

INVENTORS: Without obligation. write for information explaining the steps you should take to secure a Patent on your invention. John N. Randolph. Registered Patent Attorney. 206 Columbian Bldg.. Washington 1. D. C.

INVENTORS: The usual First Step is to have a search of the U.S. Patents conducted. so I can report on Patentability. Write. without obligation. Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty.. 939 Columbian Bldg.. Washington (1). D. C.

INVENTORS: If you have an invention for sale. patented or unpatented. write Institute of American Inventors. Dept. 30A. 1926 Eye St. N.W.. Washington 6. D. C.

CAPITALIZE on your invention quickly. Natco—2507-N. 29th St.. Philadelphia. Pa.

INVENTORS — Patent Laws encourage the development of inventions. The Rules of Practice of the U.S. Patent Office advises —unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent. as the value of patents depends largely upon the skillful preparation of the specifications and claims. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorrow, Berman & Davidson. Registered Patent Attorneys. 1433 Victor Building, Washington 1, D. C.

ATTENTION Inventors. List your patented pending; Unpatented inventions for action. I have hundreds waiting buyers. Highest cash or royalty paid for marketable inventions. Free details gladly furnished. Leslie Buford. Stratton Patent Broker and Promoter. 19 South LaSalle Street. Chicago.

INVENTORS—Send today for "Detailed Patent Information" outlining preliminary steps to be taken toward Patent Protection. also convenient "Evidence of Invention" form. Victor J. Evans & Co.. 342-F Merlin Bldg.. Washington 6. D. C.

HELP given to inventors in patent disposal to high grade manufacturers. Capital Industries. Inc.. 80 Wall. N. Y. C.

PATENTED. unpatented inventions promoted. M. Joyce Humphries. 1424 Landtitle. Phila. 10. Penna.

FILE Patents yourself. Plus invention proof $1.00. Birsh. 712-C Manhattan Ave.. Brooklyn 22.

SAVE $50. to $150. Obtain your own patent. Complete Handbook $2.00. International Patent Library. 318 Evans Building. Washington. D. C.

PATENT searches—reliable. efficient. air mail service—$6.00. Write for free invention protection form. Patent Research Service. 703 Albee Bldg..Washington 5. D. C.

CASH For your idea. 280 manufacturers need inventions. patented or unpatented. List free. Invention Bureau. 208 Clinton. Oak Park. Illinois.

84 INVENTIONS WANTED

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information. free. Institute of American Inventors. Dept. 30C. 1926 Eye St.. N.W., Washington 6. D. C.

INVENTIONS Promoted. Patented or unpatented. Write Adam Fisher Company, 183-A Enright. St. Louis. Mo.

HIGHEST Royalties—cash. Free literature. Universal Marketing Co.. 126 Lexington Ave.. New York 16. N. Y.

SMALL Inventions wanted by manufacturers. I'll help you sell your invention. Write for circular. S. Hull. 7829 Euclid. Cleveland. Ohio.

INVENTORS! Have you good. patentable ideas? Write Patent Agent Metzller. 11 West 42nd. New York.

WE are a young and growing manufacturing concern. having six plants in Grand Rapids. Michigan. If you have made application for a patent. or have a patented item. regardless of size. at present we will be glad to hear from you or talk to you regarding it. We sell nationally and internationally. If you would like to check us. refer to Dun & Bradstreet or Grand Rapids Chamber of Commerce. Remember. if you invent something. you are entitled to your share. the same as we are entitled to our share for manufacturing it. Helms Industrial Development Co.. 2145 Edgewood. N.E.. Grand Rapids. Michigan.

SELL Your Invention! Patented or Unpatented! Free information. Sales Research Company. Suite 1102. Chicago Building. State and Madison Streets. Chicago 2. Illinois.

CASH For your idea. 280 manufacturers need inventions. patented or unpatented. List free. Invention Bureau. 208 Clinton. Oak Park. Illinois.

85 PATENTS

INVENTORS: Test the commercial value of your patented or unpatented inventions. quickly and inexpensively. Write for free information. Institute of American Inventors. Dept. 30-B. 1926 Eye St.. N. W.. Washington 6. D. C.

86 PATENTS FOR SALE

LAWN Mower sharpener—hand powered —Used any locality—Four years world market. Simple construction. Long life money maker. Van Etten. 142 Gaylord. Binghamton. N. Y.

88 MANUFACTURING

WE specialize in screw machine jobs too small for the large manufacturer. Mail us specifications for prices. Vine. Hill & Co., Box 35. Swanton. Ohio.

MODELS small lot manufacturing. metals. plastics. etc.. Millburn. Burlington. Ky.

89 MODELS, MODEL SUPPLIES

MOST complete Illustrated Catalog—"O-HO OO" Model Railroad Parts ever published. Send 5c for mailing. Selley. 1377 Gates Ave.. Dept. 836. Brooklyn. N. Y.

MODEL Ship Builders! Are you looking for authentic, precision ship models? Send for richly illustrated fully descriptive catalogue in full color of famous ships of all kinds. Only 25c. Halesite Yacht Service Inc., Dept. C-42. Halesite. Long Island. N. Y.

SHIP model kits and fittings. most complete stock in New England. of Boucher. Fisher. Marine Model. Model Shipways. Fittings. plans. tools. model yacht equipment. Illustrated catalog 25c coin. James Bliss & Co.. Inc., Dept. M 220 State Street. Boston. Mass.

SHIPMODEL kits and fittings of authentic design and detail. Model kits include brigs. fisherman. cutter. clipper. New catalog. 15c. Model Shipways. Folio 40. 476 Main St.. Fort Lee. N. J.

Copyrighted material

SHIP and Yacht model fittings; blueprints. Send 25c for illustrated catalog No. 21—Listing hundreds of items. A. J. Fisher, 1002-2 Etowah Ave., Royal Oak, Mich.

SHIP Model and yacht supplies, complete large 64 page catalogue, 30c. Wm. Wild, 510 E. 11th St., New York City.

RADIO Control Planes. Complete. Less than $100.00. 10c please. Hobby Center, 12240 Gratiot. Detroit.

RAILWAY models, complete line. Combined HO and O gauge. catalogue. 50c. Walthers. 241 Erie. Milwaukee 2. Wis.

POWER Models—steam and gasoline engines. steam traction engine. metals. tools. Catalog 35c. Charles Cole. Ventura. Calif.

BUILD Historic Ship Models. Complete Kits 39c to $8.50; Send 10c for catalog. Ideal Models. 21 West 18th Street. New York 11. N. Y.

LIONEL 1948 Illustrated Listings in "Model Rail News"; Models all Gauses. Three issues. 25c. Train Shop. 112-S Broad. Providence 3. R. I.

MODEL Builders Supplies. Castings. machined parts. tell us your needs. John Maskol. 6806 Crossway. Baltimore 22. Md.

STEAM Boiler—for model engines. Uses "Sterno". Withstands 300 lb. pressure. Cast bronze. silver soldered. Complete with pressure gauge and fittings. $22.50. The Miniature Steam Engine. Working model. Brass and iron. Bore 9/16; stroke 11/16; weight 2 lb. Assembled $17.50. Ross. 68 West Broadway. Section M. New York. N. Y.

IF you were six inches tall you could sail this model boat— a planked up. jig built. 15½" detailed model of Snipe. Send stamped. self addressed envelope for illustrated particulars of this interesting. inexpensive project. Standley Models. Box 164. Green Bay. Wisconsin.

BRASS Gears and model supplies for the inventors. Send 10c for catalog. Pierce Model Works. Tinley Park. Ill.

PATENT models. experimental devices constructed. Reasonable. Nelson Manufacturing. Woodburn. Oregon.

FREE! Amazingly different model. Given to introduce thrilling Jet Plane kit. $2.00. Herblin. 35-45 79th St.. Jackson Heights. N. Y.

90 MOLDS AND MOLDING MATERIALS

CREATE your own products. Our "Flexible Mold Master" teaches amazingly simple method for making flexible molds for plaster novelties. Complete with illustrations. $1.00. Emco Enterprises. 6750 Stony Island Ave.. Chicago 49. Ill.

91 HOME CRAFTSMEN

LEATHER-Crafters: Free 1948 catalog showing easily completed projects. full line of tools. hides and accessories. Ester Leather Co., 145 St. Paul St., Rochester 4. New York.

AMAZING New crafts—also weaving. kites. leathercraft. metalcraft. intarsia. Free catalog. Pickwick. 725 West 172d. N. Y. 32.

LAWN chairs. Toys. Novelties. Garden figures. Furniture. etc. 68 popular plans and patterns. $1.00. Mastercraft 6S. 7041 Olcott. Chicago 31. Ill.

MAKE Shell Jewelry profit pleasure. Shellcraft book free. 450 Caribbean shells including findings for making six dollars with $1.00. Shell Company. N.W. First Street. Miami 36. Florida.

PATTERNS: Lawn Ornaments. Weathervanes. Letters. Numerals. Silhouettes. Plaques. Frames. Toys. Jig & Bandsawed Plywood Novelty Furniture. Craft-Hobby Books-Booklets. Decals. Tools. Etc. Further details free. Wo-Met Shop. Ashburn. Georgia.

COPPER and Brass Materials. Complete line for Craftsmen and Workshops. Catalog Free. Groundmaster Company. Boulder. Colorado.

BUILD your own dishwasher. Washes dishes sparkling clean! Easy. inexpensive for anyone with simple tools. Complete plans $1.00. Hall. Box 355-E. Leesburg. Fla.

LEATHER LACING 2c per yard. Cut it yourself with professional table model. adjustable thong and lace cutter. Cuts continuous 3/32". ⅛". ¼" or ⅜" widths. Only $4.95 post paid. Send check or money order. Money back guarantee. 10c brings descriptive literature. Agents inquiries invited. Western Craft Guild. Dept. A. 4655 Elm Court. Denver 11. Colorado.

LEATHERCRAFT! Complete stocks of leathers. tools. supplies. Immediate shipment. Free catalog. Kit Kraft. Dept. 3203 W. Washington Blvd.. Los Angeles 16. Cal.

PICTURE frames—Make your own—Details free. Frame Shop. 1134-A Las Palmas. Los Angeles 38.

LAWN chairs. toys. novelties. garden figures. furniture. etc. 68 popular plans and patterns. $1.00. Mastercraft 7S. 7041 Olcott. Chicago 31. Ill.

CASTINGS. make your own. bronze. aluminum. etc.. Price list supplies and equipment free. Lehnert Company. Norwood 3. N. J.

93 BUILD IT YOURSELF

ROTARY type. power lawn mowers. Complete machines or parts. Modern Mower. Lohrville. Iowa.

STREAMLINES. Built-in kitchen cabinets to fit any kitchen. Complete. easy to understand detailed plans and specifications showing "professional" construction methods. All for $1.00. Thombert Co.. Box 447A. Newton. Iowa.

BUILD your own Tilting Table Power Saw. We furnish plans and metal parts. Write for free circular. William H. Crandall Company. 1009 Fruitvale Ave.. Oakland. California.

MAKE your own shipping cartons. Instructions $1.00. Mewburn. Banff. Canada.

BEAUTIFUL Brass Weathervane. 15" High. Assemble it yourself in an Evening. Kit $4.75. E. Helander. Box 442. Providence. R. I.

BUILD power lawn mower from spare parts. Complete drawings and instructions $1.00. L. Wishop. Box 304. Rockton. Illinois.

MAKE your own Modulite Building Blocks. Weigh only 17 pounds against ordinary 48 pounds. Instructions 25c. Particulars stamp. Peerless. New Lenox 1. Illinois.

"CONCRETE Block Homes." 32 page booklet: drawings. instructions on how to build. $1.00. H. C. Lightfoot. Civil Engineer. Richboro. Penna.

LEARN by doing. Build "Speedy" motor. Instructive. enjoyable little project. Guaranteed satisfaction. You get—complete parts. wire. battery. illustrated instructions. plus. "How Motors Work" lesson. $1.00. J. Madden. 50 Granite St.. Brooklyn 7. N. Y.

95 OLD GOLD, WATCHES, ETC.

CASH air mailed for old gold. jewelry. Rywell. Harriman. Tennessee.

HIGHEST Cash for old. broken jewelry. Mail Gold Teeth. Watches. Rings. Silverware. Diamonds. Spectacles. Satisfaction Guaranteed. Free Information. Rose Smelting Co.. 29-Y East Madison. Chicago.

WATCHES. wholesale: Rebuilt Elgins. Walthams. Bulovas. etc.. new and used railroad. diamond. rhinestone. lapel. $9.50 up. Catalogue free. Brookins. B-1975Z. Little Rock. Ark.

GOLD immediate cash for gold teeth. watches. jewelry. diamonds. Modern refining assures highest prices. Free information. Dr. Herte's Gold Service. Box 218. Wauwatosa. Wisconsin.

96 JEWELRY

JEWELRY Findings. Lowest Prices. George Sassen 154 Nassau Street. New York 7.

CERAMIC Jewelry Supplies. Bar Pins. ear screws. for ceramic and woodworkers. also. glass and sea shell assemblers. Free catalog. Philadelphia Badge Co.. 1007 Filbert St.. Philadelphia. Pa. Dept. E-1.

SEMI-FINISHED Cowboy buckle sets. rings. etc.. in silver. very clean. Send $1.00 for sample ring. state size. Will cast 1 or 10,000 items in gold or silver from your model or drawing. Free circular on request. Southwestern. Box 1399. El Paso. Texas.

RHINESTONES — Moonstones — Pearls —Findings. Free literature. Herber. 1360-B Hicks. New York 67.

MANUFACTURE costume jewelry at home for profit. hobby. therapy. Free wholesale supply catalogue. Instructions. Florida Supply House. Bradenton. Florida.

JEWELRY and findings. Most extensive line—low prices. Instructive list and sample 10c. Doremby Company. Chisholm. Maine.

JEWELERS findings. supplies. Latest catalog. 10c. George Sassen. 154 Nassau Street. New York 7.

STUN Your friends with genuine. sparkling. brilliant-white Zircons. Cut. polished. mounted just like diamonds. Amazing diamond-like appearance. Top-quality. Hard for even experts to tell the difference. Beautiful settings 14K gold. Over 100 gorgeous latest-style rings to choose from. Attractive low prices. Send for big Free Catalog. U. S. Zircon Syndicate. 139 N. Clark. Dept. 16. Chicago 2.

97 TOBACCO & PIPES

SECONDS $5.00 pipes 65c. Briar block. bit. instructions 75c. Free literature. Carvapipe. 2829-F Dixie. Hamilton. Ohio.

98 RAZOR BLADES, SHAVERS

100 DOUBLEDGE blades. Blue Steel. $1.00 P.P. Cerny. 5006 Dewey. St. Louis 16. Mo.

100 MISCELLANEOUS

TOY Pistols. wholesale and retail. Circular free. C. C. Groff. 116 Broad St.. Lancaster. Penna.

MEN! Large size shoes. large size sox: We specialize in large sizes 10 to 16. widths AA-EEE. Oxfords. Hitops. Work shoes. Guaranteed extra quality. Free Catalog. Kingsize. 553 Brockton. Mass.

ALLURING pin-up girl close-ups in unretouched natural poses by professional female models. Sent in plain envelope. Six different wallet size—25c or six large 8 x 10 suitable for framing—$1.00. Box 862. East Pittsburgh. Pa.

HULL Automobile Compass. value $4.95. brand new. $2.50. Prisms for 6 x 30 or 8 x 30 binoculars. brand new. $1.50 each. Off set prisms to be attached to 7 x 50 B & L Binoculars. gives double the field of the ordinary 7 x 50 binocular. Cost $98.00. special $25.00. Green sunshades for binoculars. size 6 x 30 and 7 x 50. snap on type. value $7.50. special $1.25 per pair. Forward money order. No C.O.D. shipments. Send 25c for catalog of new and used guns. ammunition. binoculars and powder flasks. Public Sport Shops. 11 S. 16th Street. Philadelphia. Pa.

MODELS Preview lists 100 United States and Canadian models agencies; contains illustration 150 beautiful girls available to pose personally for reputable artists and photographers. Send one dollar to Models Preview. 1507 North Larrabee Street. Chicago 10. Illinois.

FREE! Expert analysis your Sales Letter. Ad-Man Davison. Westport. Connecticut.

GOOD Deal! Mail me 1 to 6 ties you dislike. I'll return equal amount expertly cleaned all different. Pay Postman $1.00. Tie Box 3875-D. Phila.. Penna.

CAN You Tie This? Send up to six neckties you are tired of? Return same number cleaned. different ties received same way. You pay Postman $1.00. Deal? Tiechange. Box 3368-S. Columbus 11. Ohio.

RECEIVE Giant Mails. Samples Galore! Two-year listing $1.00. Nine-month 50c. Three month 25c. Stanford. 6220-N 16th. Philadelphia 41.

ARMY Twenty U. S. Shoulder Patches $1.00. Springer's. El Paso. Texas.

SWAP neckties. Send six ties with $1.25. You get six others. Swap-A-Tie. Rumson. N. J.

WORRIED about War. depression? Book $1.00. Moyer. B-252-PS. Milton. Penna.

MEN! Brockton Made Shoes Any size. width. color or style $7.95. Send money order and we pay postage. You pay postage if C.O.D. Finest Quality. Why Pay More? Mallcan Co.. Box 918. Brockton. Mass.

PANNING Gold—Two instruction books 25c. Old Prospector. B-119. Dutch Flat. Calif.

DANCE Instruction in the privacy of your own home. Booklet free. Engstrom Dance Studios. S1. Box 358. Grand Island. Nebr.

COMPLETE Pen Set $1.00. 3 Smooth writing Ball Point Pens. Green. Red and Blue in a handsome leatherette case. Waldorf Co., 775 East 8th Street. Brooklyn 30.

Copyrighted material

BRILLIANTLY-colored outdoor pictures 25c. 7—$1. Books sell out: 6—$1. View-Photo-Western Card Sale 200—$1. 500—$3. You'll be thrilled with any assortment. Mediator Lefferts. Box 121-S Brooklyn 25. N. Y.

BEAUTIFUL stone collections. slabbed & rough. $1.00. Nelson & Berger. 701 Montague. Dunlap. Iowa.

FRIENDSHIP is priceless. 10c will bring you copy of my Friendship Magazine. bet you'll like it. Write Jay Wilcox. Box 384. Eastport. N. Y.

MEDICAL Laboratory Technicians in great demand. We train you in your own Home. in your spare time. Also home study course in General Chemistry. Catalogue free. Imperial Technical Institute. Box 973-S. Austin. Texas.

APPLIANCE Repairing pays "Big money" start home or office. Easily mastered Manual shows "How." Mail dealers wanted. Details free. C. A. Griffith. 132 Water St.. Fredonia. N. Y.

BIG Opportunity mail 10 cents. Distributors. 730 West Gift. Peoria 5. Illinois.

SURVEYORS—Builders—Draftsmen expensive transit or protractor unnecessary. Layout angles with tape or rule faster. simpler. more accurately. Approved by colleges. Send $1.50 for book. complete tables. directions. McKinley. 642 Beaubien. Detroit 26.

A COMPLETE illustrated manual on repair. maintenance. and cheating prevention of Slot Machines. $5.00. Box 156. Lewiston. Ida.

GOVERNOR—build your own from kit supplies. Free circular. Wisconsin Hydraulic Equipment Co.. 226 W. Greenfield. Milwaukee. Wisconsin.

BUILDING a new home? Then get the folio "Facts About Prefabricated Houses" today. Send $1.00 to R. M. Herriott. Box 953. San Antonio. Texas.

HYPNOTIZE! Control the minds and actions of others! Completely illustrated course $1.00. Money Back guarantee. Fowler. Box 1284. Boston 4. Mass.

ART Photos! Sample 50c. 3 for $1.00. Post Office Box 2011. Phoenix. Arizona.

FIREWORKS — Salutes; Chinese and American. rockets. roman candles. torpedoes. sparklers. pistols and caps. Get price list. $5.00 minimum order. by express only. Frank Patterson. Hawesville. Ky.

HOW to grow enormous plants and make oleo taste like butter $1.00. 24 profitable formulas 50c. Cy Bibbs. 2233 Eastern Ave.. Indianapolis. Ind.

ABACUS. Now improved and easier to use. An interesting way to learn arithmetic. A fast way to add. subtract. multiply. divide. and extract square roots Specially illustrated instructions show how. New model. $3.50. Send for free lesson and details. Loy's Chinese Calculator Dept. 85-S. 1317 Rhode Island Ave.. N.E. Washington 18. D. C. Agents wanted.

C-THRU-Mirrors. See thru one side mirror on other. 3" x 4" or 2" x 6" sizes $2.95. Bruce Enterprises. Dept. GD. North Hollywood. Calif.

101 FOR SALE—MISCELLANEOUS

ACTUAL (Trick) Photograph. Defies the eye—Send 10c. Photo Center. Billings. Montana.

GOVERNMENT surplus. camping equipment. civilian bargains. work clothes. general merchandise. free circular. Baseball caps 59c. 89c. 98c; Sunglasses 75c. $1.75. $2.45; white sailor pants $1.45. caps 55c. include postage. Imperial Outlet Co.. 529 Nostrand Ave.. Brooklyn 16. N. Y. Dept. A.

102 WANTED MISCELLANEOUS

MERCURY—Highest prices. Free Containers. Write Mercury Terminal. Norwood. Mass.

103 FOR THE HOME

BUTTER doubling. Other unique receipts $1.00. Beaudette's. 4845 Lyndale South. Minneapolis.

104 PERSONAL

HOW You can find out! Information discretly developed. Any matter. person. problem. anywhere. Personal-Business assignments. representations undertaken. Nationwide. Officially licensed. bonded service. Established 1922. Reasonable. Confidential. William Herman. 170 Broadway. New York.

BORROW by mail. Loans $50.00 to $300.00 to employed men and women. Easy. quick. Completely private. confidential. No endorsers. Repay in convenient monthly payments. Details free in plain envelope. Write State Finance Co.. 320 Securities Bldg.. Dept. F-14. Des Moines 9. Iowa.

RUPTURED? Positive comfort, no understraps, no steel, no elastic. Write Smith Manufacturing Co.. Preston. Ontario.

BUY Vitamins Direct. Amazing Savings. Money Back Guarantee. Our 9th year! Postcard. Matoska Products. White Bear Lake. Minn.

TIES Exchanged. Send eight ties and $1.00. Receive eight. Stahl's. Williamsport, Indiana.

HAIR Falling? Dandruff? Write Trichologist. 139 Lewis Street. Phillipsburg. N. J.

GLOBAL viewcard supply; worldwide letter remailing service. Free particulars. Travelpost. Box 1436. Brawley. California.

MAIL Forwarded from Miami Beach. Florida. 25c per letter. Box 618. Hialeah. Florida.

SINUS—Stop Misery! Three surprise items. $1.00 M-B-G. X-ray Photo Lab.. 930 N. Main. Akron 10. Ohio.

BORROW by mail. Loans $50.00 to $300.00 to employed men and women. Easy. quick. Completely private. confidential. No endorsers. Repay in convenient monthly payments. Details free in plain envelope. Write State Finance Co.. 216 Savings & Loan Bldg.. Dept. F-14. Des Moines 8. Iowa.

INFORMATION for single people by Human Relations Consultant. University Graduate. Dr. B. Long. Box 375. Los Angeles 53. Calif.

WORRIED? Impartial analysis and advice given. $5.00. Confidential. Lewit. 1228 S. Lawndale. Chicago. Illinois.

LETTERS remailed from San Francisco. 25c each. A. Sanchez. P.O.B. 635. San Francisco. Calif.

STOP Smoking. Quit cigarettes like magic. Latest scientific method shows you how. Booklet all instructions $1.00. Psychogenic Science. Dept. A. Box 402. Canton 1. Ohio.

NEW YORK City Confuse friends. 5 Cards mailed $1.00. 10—$1.50. Letters remailed. 25c. $2.00 monthly. Free details. Jaffe. 475-5th Ave.

TRADE six neckties and $1.00 for six drycleaned ties we received the same way. Tie Exchange. 231 S. Ithan St.. Philadelphia. Pa.

RUSSIA. Palestine in Prophecy. 15c. Bulletin. Box 87. Cathedral Station. New York 25.

GET your 200 year calendar today. Can look up dates from 1801 to 2000 A.D. Small wallet size book. Send one dollar to R. & P. Ignomirello. 126 Schley. Newark 8. N. J.

HELP for Hay Fever Sufferers. Money back guarantee. $1. Leona Stoewsand. Dept. A. Room 217. 301 E. Regent. Inglewood. California.

ART. Scenic photos. Sample 35c. 4—$1.00. Color Slides 50c. 3—$1.00. Movies—Sample. Brochure 25c. Novelty. 1227 E. Van Buren. Phoenix. Arizona.

SOUTH America: Investments. employment. investigations. travel advice. Receive full accurate information forwarding $1.00 in registered airmail. Morgens. Casilla 5025. Santiago III. Chile SA.

TRADE neckties. send 7 used tired. Want you receive 7 used clean. Pay postman $1.00. P. O. Box 2695. Kansas City, Mo.

105 ADVICE

COSMIC Rays discovery revolutionizes science. bringing telepathy. instantaneous healing and oneness! Startling book. "Cosmic Rays and Cosmic Consciousness" ($2.50) mailed on approval. Send no money. Finding inspiration. courage. strength. success. enlightenment. ecstasy. mail check; otherwise return book. pay nothing—Crane. publisher. Kingsport 1. Tenn.

106 ADVERTISING

ADVERTISING Sensation! Reach 2,100,000 families. $32.90 inch. Display. classified. ratebook (newspapers. magazines. mailing lists). advertising assistance, free. Chicago Advertising Agency. 20-PS, West Jackson. Chicago 4.

24 WORDS in 64 Weeklies $4.96. J. Darnell. 730 Hays. Jackson. Tenn.

INCH display advertisement Mail-Order-World. year $24. Wood's Popular Services. Atlantic City (N. J.)

107 ASTROLOGY

CORRESPONDENCE Course in Astrology. particulars. Reid. 696 Gerrard. Toronto. Canada.

113 DRAFTING

SAVE on drafting materials. Free catalog. Draftsmen's Supply Co.. 187 W. Madison. Chicago 2.

115 DRAWING & ART SUPPLIES

DRAWING boards. artist's palettes. Literature dime. Star Specialty. Box 2555. Paterson. N. J.

YOU can be an artist. New device makes drawing simple tracing. $6.95. Bruce Enterprises. Dept. GC. Box 235. North Hollywood. Calif.

117 TATTOOING SUPPLIES

TATTOOING Outfits. Supplies. Illustrated List Free. Zeiss. S-484 Lesley. Rockford. Illinois.

120 CANDY MAKING

MEN-Women—"Most Everybody Likes Candy". Learn to manufacture in a professional manner at home. (Our 38th year.) Ragsdale Candies. East Orange. N. J.

125 WOODS

BUSINESS cards of real wood. Write Cards of Wood. Manlius 2. N. Y.

FLORIDA Cypress chairs—adults size. Hand made—rugged. durable. $2.95 F.O.B. Gibson's Rustic Furn.. 832 N. Mills. Orlando. Fla.

FILE Patents yourself. inexpensively. Information free. Birsh. 712-A Manhattan Ave.. Brooklyn 22.

129 MAGNETS

ALL Types—Write for free catalog. Engineered Products Company. Sandusky. Ohio.

ALNICO magnets. Free list. Terry Sales Company. 3726 South Detroit Av.. Toledo 9. Ohio

ALNICO magnets—Seven assorted $1.00! Ronald Eyrich. Box 849. Milwaukee 1.

131 TREASURE FINDERS

METAL Detectors. The Very Latest Circuit. Free Literature. Hedden Metal Detectors. 3329 Liberty St.. Pittsburgh 1. Pa.

TREASURE Hunters! Radically new Goldak locators. New featherweight Model 101 weighs only 11 pounds! Revolutionizes location of Gold. Silver and Minerals. Money-back guaranteed superior any other. Write The Goldak Co.. 1544 W. Glenoaks. Glendale 1. Calif.

M-SCOPE Metal Locator fully guaranteed and unsurpassed in efficiency. New featherweight models. Time payment plan. Free literature. Fisher Research Laboratory. Inc.. Palo Alto. Calif.

137 DETECTIVES

DETECTIVE Training. Phillips Secret Service. 1917C. N. Kenneth. Chicago 39. Ill.

DETECTIVES—Work home—Travel. Experience unnecessary. Write Wagoner P-125 West 86th. N. Y.. N. Y.

142 INFORMATION

INFORMATION. any subject about Houston. Texas. $1.00 M.O. with request. Reliable. Dept. PS-2. 1052-N. Houston 11. Texas.

"MOST Everybody Likes Candy". Learn to manufacture in a professional manner. (Our 38th year.) Ragsdale Candies. D7. East Orange. N. J.

QUESTIONS? 25c brings full information of our "Information Service." C. A. Gray. Inc.. Dept. 'A.' 418 Broad Street. Syracuse 10. N. Y.

143 NAME LISTS

MAILING lists; most classes. 1000 $5.00. Free Prospectus. Dixie Service. King. N. C.

300 CERTIFIED Opportunity Seekers $1.00. Trable. 1018½B Elm. Dallas. Texas.

SOUTH America! List of 125 companies with foreign interests: $1.00 or C.O.D. Foreign Service Institute. Box 3934 K Miami 24. Fla.

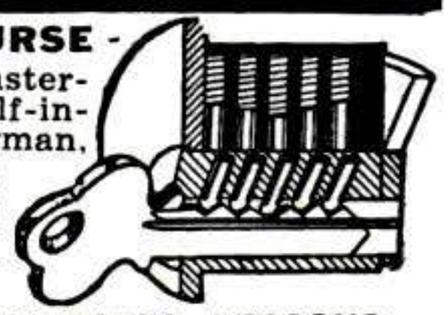
144 MILITARY INSIGNIA

FREE—3 Military Emblems. with Catalog 10c. Hobbyguild. X35 West 32. N. Y.

Copyrighted material

locksmithing and key making

PRACTICAL UP-TO-DATE COURSE - How to pick locks, de-code, make master-keys, install, service, etc. New, self-instruction lessons for every handyman, home-owner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith, cycle shop. Good steady money-making trade!



53 EASY ILLUSTRATED LESSONS
Full price only **$3.95,** nothing more to pay. Satisfaction or your money back. Fill in coupon at bottom of page and mail today.
NELSON-HALL CO.
1139 S. Wabash Ave. Chicago 5, Ill.

watch and clock repairing

LEARN AT HOME—IN YOUR SPARE TIME
Prepare now for a happy future of prosperity, security. Fascinating high-grade occupation for men of almost any age or physical condition. You can earn while you learn.
PRACTICAL COURSE IN HOROLOGY How-to-do-it lessons for beginners as well as those already in the trade. Thorough self-instruction training in American and Swiss watches, clocks. Contains a wealth of helpful photos, drawings, diagrams, charts, etc. Only **$4.95** for everything, complete. Satisfaction or refund guaranteed. Mail no-risk coupon below.

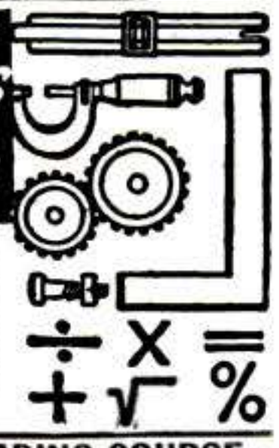
practical RADIO servicing

SELF-INSTRUCTION COURSE Teaches you the practical side of radio . . . repair, adjustment, operation, alteration, trouble-shooting. No previous knowledge necessary. Prepare to set up a shop of your own—or train for the big industrial electronics field. Simplified lessons, including mathematics, review questions, problems, answers. Up-to-date! Only **$3.95,** complete. Money-back guarantee. Use coupon below.

REAL ESTATE BUSINESS

The foundation of all wealth is land! Train yourself for a career in this booming profession. Here is the information you need on how to get started and how to get ahead in real estate. Includes instructions in appraisals, valuations, management, investments, practical real estate operating, low cost housing, the law on real estate transactions including legal forms, etc., salesmanship, and many other subjects a successful real estate man must know. Strictly up-to-date. Complete, only **$6.95.** Money-back guarantee. Use No-Risk coupon below.

Short-Cut Mathematics
COMBINED WITH
Practical Mechanics Simplified



Be a "master mind." Learn how to juggle figures, do baffling tricks with numbers. Add long columns of figures this lightning-quick, short-cut way. Multiply 4 figures by 4 figures without old-fashioned multiplication. Here are speedy, simplified systems used by stage "wizards," expert accountants, engineers. Only **$1.49.** Course includes illustrations, problems, answers. Mail coupon below!

COMPLETE BLUEPRINT READING COURSE
Interesting, simplified self-instruction lessons for builders, mechanics, electricians, plumbers, welders, carpenters, automotive & aviation workers, etc. 24 volumes include over 600 actual blueprints, diagrams, other instructive step-by-step pictures. Unusual bargain for any practical man. Complete, only **$6.95,** postpaid. Satisfaction or refund. Coupon below.

BUILD IT YOURSELF
Be a practical handyman. Save time and money with these professional Tricks-of-the-Trade. Carpentry made easy! New self-instruction course in one handy volume, complete with full page photographs, diagrams, etc. Teaches woodworking, painting & decorating, upholstering, power tools, cabinet making, etc. Full price only **$1.98.** Money-back Guarantee. Mail coupon today!

Mail This No-Risk Coupon—Quick Action!

NELSON-HALL Co., 1139 S. Wabash Ave., Dept. F-01, Chicago 5, Ill.
Please rush me the items I am checking below. It is understood that if I am not 100% satisfied I will send the material back within 10 days and you will make full immediate refund, without question or quibble.

( ) Watch & Clock Repairing $4.95
( ) Locksmithing & Key Making 3.95
( ) Practical Radio Servicing 3.95
( ) Real Estate Business 6.95
( ) Short-Cut Mathematics 1.49
( ) Blueprint Reading Course 6.95
( ) Build It Yourself 1.98
( ) Apartment House Management 5.95
( ) Jewelers' Encyclopedia 1.69
( ) How to Sell Life Insurance 6.95
( ) Complete Shorthand Course 4.95

☐ I enclose $.....in full payment. Ship postpaid.
☐ Ship COD for $.....plus postage and COD charges.

Name.....

Address.....

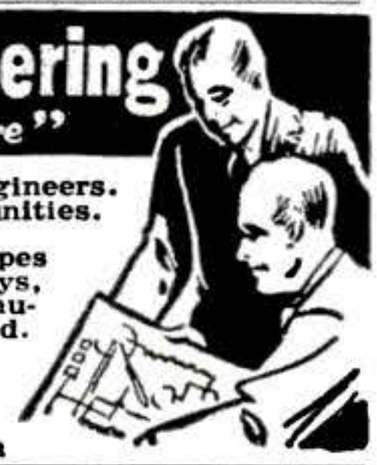
Famous BAILEY DIESEL SCHOOLS
Now Accepting
CIVILIAN STUDENTS!

Bailey has a national reputation for "finest training methods." Bailey teaches you fundamentals, plus the practical application of theory in plenty of actual shop work. Bailey is *approved* by industry. Bailey graduates get the jobs!

Civilian men and boys over 17 who are ambitious to get ahead will act now. Send for FREE catalog. No salesman will call.

BAILEY TECHNICAL SCHOOLS
1656 So. Grand Blvd., St. Louis, Mo.

Electrical Meter Engineering
"The Profession With a Future"



Utilities pay good money to trained Meter Engineers. Increased demands regularly bring new opportunities.
HOME STUDY COURSE
Practical, up-to-date home training covers all types of meters, demand meters, instruments, relays, installation, testing, calibration, repair. Enthusiastic graduates throughout U. S. & abroad.
Low Cost—Easy Terms—Diploma Granted
Write Today for Free Booklet
In Business Since 1909
FORT WAYNE CORRESPONDENCE SCHOOL
Dept. 568 Fort Wayne 2, Indiana

BE A REAL ESTATE BROKER

FREE BOOK TELLS HOW

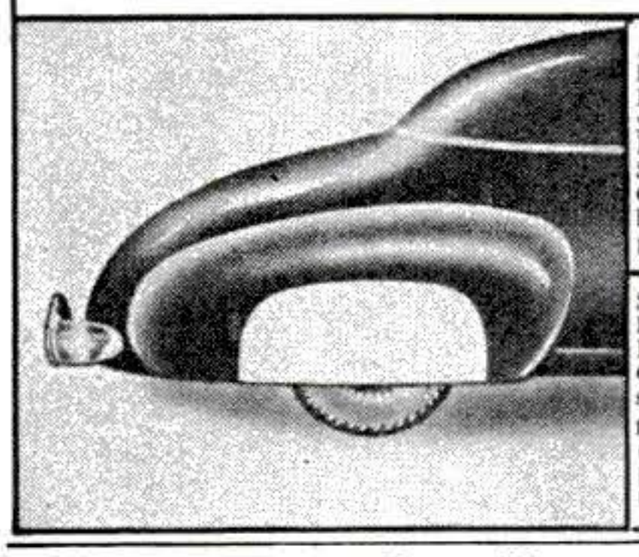
Start and run your own business *Quickly*. All phases of business taught in Home Study or Classroom—Both G. I. Approved. WRITE TODAY for Big Illustrated Book. WEAVER SCHOOL OF REAL ESTATE, 15 East Pershing Road, Dept. PC, Kansas City 8, Mo.

ARMY SURPLUS A-C PLANTS

Nation's greatest bargains in 110-volt, 60-cycle, 2500 and 600-watt plants. Also plants without engines. FREE CATALOG!

LECO ENGINEERING CO. Box 908-PS6, Lincoln, Nebr.

FENDER SKIRTS . . . . . $17.20 PER PAIR



For Ford, Chev., Merc., Plym., DeSoto, Chry., Dodge, Kaiser-Frazer, and Buick. Beautify your car—bring out the flowing lines inherently designed there. Sparkling beauty you'll like. Constructed of heavy gauge body steel finished in prime, perfect fit.

SANDEE MUFFLER CO.
Box 296 La Tijera Sta.,
Los Angeles 43, Calif.
Gentlemen: Please send me one set of Sandee Fender Skirts to fit my .....
(year and make of car).
☐ Check for $17.20 enclosed
☐ Ship C.O.D.

Say You Saw It In Popular Science

PRECISION JEWELERS SCREW DRIVERS
Complete Set of 8 for Every "Hobbyist"

At last—a complete set of precision screw drivers to meet the needs of every model builder. Not a miniature but the same type set used by U. S. Navy for precision instruments and watches during the war. Brass knurled handles, hexagon heads, finest tempered steel blades. Sizes 2-9. Never before a set of this quality and precision at such a low price. Your money back if not satisfied. C.O.D. $2.00 plus postage or send $2.00 and we pay postage.

PINE WATCH CO., Rm. 40, 29 Eldridge St., New York 2, N. Y.

Copyrighted material

GET INTO BUSINESS for YOURSELF

meet the demand for... *Metalized* BABY SHOES ...in your own home in spare time

Isn't This What You Are Looking For?

1. Steady Income
2. Permanent Future
3. Wide-open Market
4. No House to House
5. Plan Works for You
6. Backed by 25 Year Old Company
7. No-Risk Trial
8. Money-Back Guarantee

WE HELP YOU • STEP BY STEP!

- **HOW TO START**
- **HOW TO BRING THE BUSINESS**
- **HOW TO METALIZE THE WARNER WAY**
- **HOW TO PYRAMID PROFITS**

This is a lifetime opportunity! No matter what you're doing now, you can get set for the future while beating today's high cost of living. Our plan offers everything you need to know . . . a completely charted path to personal independence — with your home as your "factory."

This tested and proved plan is working right now. Backed by an old company, it's sent to you on a No-Risk Trial, Money-Back Guarantee!

The exclusive Warner Method applies an actual coat of pure metal, in genuine Gold, Silver or Bronze finish, "Eternalizing" Baby Shoes and other keepsakes forever. The demand for these Metalized Keepsakes is big . . . and getting bigger every day. (More than a million dollars' worth last year.) In every way, it's a proved proposition. Proud parents everywhere buy on sight!

A NEVER ENDING MARKET

No matter where you live, small town or big city, there is a never ending, ready-to-buy market for "Eternalizing" Baby Shoes — more than 3,500,000 babies this year. This tested plan reaches out and brings in the business. Spare or Full Time, you can make money!

BE YOUR OWN BOSS

Get the facts on this new opportunity. Mail the coupon below . . . TODAY. We'll send you fully descriptive literature, on our No-Risk Trial and Positive Guarantee: "Money Back If You Say So."

SEND THIS COUPON NOW, FOR SURE!

WARNER ELECTRIC COMPANY, Dept. 26
1512 Jarvis Ave., Chicago 26, Illinois

Please send, without obligation, complete details about your No-Risk Trial, Money Back Plan for "Eternalizing Baby Shoes for Plus Profits."

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

WARNER ELECTRIC COMPANY, Dept. 26
1512 JARVIS AVE. CHICAGO 26, ILLINOIS

Bar Bells

Buy Direct From Factory
Write for free booklet and price list
$8.95 up

INDEPENDENT IRON WORKS
2416 East 23rd Street, Dept. C
Los Angeles 11, Calif.

LEARN CARPENTRY & MASONRY

Write for Free Catalog. Make big money in the Building Trades. Learn now while opportunities are greatest. Train in our well equipped shops. Approved for Veterans.

MIDWEST SCHOOL OF BUILDING TRADES, Dept. A-26
411 N. Center Street Bloomington, Illinois

FIX SEWING MACHINES

BIG MONEY. Spare or full time. Open your own neighborhood shop. Thousands need repairs. Send for complete Service Manual—only $1.98 postpaid. Money back guarantee.

SEWING MACHINE SERVICE CO. Hamilton 26-BB, Ohio

NEW EASY WAY TO MAKE MONEY at HOME

YOUR COST ONLY 5c YOU GET $5.00, FULL OR SPARE TIME.

It's easy to Bronze Baby Shoes. Business still in infancy. Get in on ground floor and skim cream of profit from rich and never-ending market. No experience needed. **Learn in one week.** Income up to $1,000 a month full time—$50 to $75 weekly in spare time. We furnish complete kit and full instructions. Simple as A B C to become an expert.

FREE FACTS. Write today. Don't send a penny. Just name and address in letter or postcard. Be the first in your territory to reap rewards waiting. Costs only 5c to bronze shoes. Sell for $5.00! This is too good to miss. Get facts today. Write to

KIKTAVI COMPANY, Dept. 28
8620 So. Ruthelen Los Angeles 44, California

HAMS! EXPERIMENTERS! SCHOOLS! LABS! OTHERS!

SAVE ON GOV'T SURPLUS RADIO SUPPLY ASSORTMENT $25.00

On a deposit of $5.00, we ship you C.O.D. (Balance $20.00, freight collect) an amazing quantity of surplus radio items, subject to your inspection and approval. Assortment so big you can probably sell a few unneeded items for more than cost of entire lot. When you name a few items wanted, we try to include them. If not delighted return to us freight collect, money back guarantee. Your only cost will be freight charges one way. Order now.

Also send for our special value bulletins.

ABELL DISTRIBUTING CO., Dept. 4
7 E. Biddle St. Baltimore 2, Md.

JUST OUT! HARD-TO-FIND NEW PORTABLE

RADIO ANTENNAS

Gov't. Surplus as used on Army Tanks.
Telescopic—Rustproof—Have tremendous Pick-up—Eliminate Dangerous Wiring.

NOISE FREE RECEPTION

FOR HOMES, BOATS, AUTOS

Exceptionally rugged sections. Handy for camping, also useful for transmitting, F.M. & Television Sets. Each securely packed. Easy to install anywhere.

$15.—12 FT. SOLID BRASS $4.95. *(12 Sections) with clamps Nut, Lug, and wire (postpaid)*

$13.50—9 FT. SOLID BRASS $3.95. *(9 Sections) with clamps, Nut, Lug, & wire (Postpaid)*

$12. — 7 FT. SOLID BRASS $3.45 *(9 Sections) with Lo-Loss Lead & Mounting Bracket (Postpaid)*

QUANTITY LIMITED

ORDER TODAY—Mail check or money order—State Antenna desired. All prices postpaid or sent C.O.D. plus postage.

SPECIAL 10% DISCOUNT ON ORDERS FOR 3 OR MORE. Money Back in 10 Days if not satisfied.

RADIO HOSPITAL 442 East 86th St., Dept. B18 NEW YORK 28, N. Y.

Copyrighted material

Department store demonstrations show how television makes shopping easier—saves time!

Shopping by Television—a coming convenience

You know television as an exciting source of news and entertainment. But what about its many other uses?

250,000 people—at a demonstration arranged by RCA Victor—learned the advantages of "Shop-by-Television." Television receivers, located throughout a big store, showed customers what was going on in other departments . . . saved time, made shopping simpler.

88% of these customers said television was a major help . . . 62% said the program had drawn them to the store . . . more than half intended to visit departments where televised merchandise was sold. Sales of many televised items jumped 200% above normal!

Beyond its value *within* a store, "Shop-by-Television" is already reaching across the air waves to enter customers' homes. How convenient it will be to *see* merchandise on the screen of your RCA Victor television receiver, and then be able to do much of your shopping by telephone!

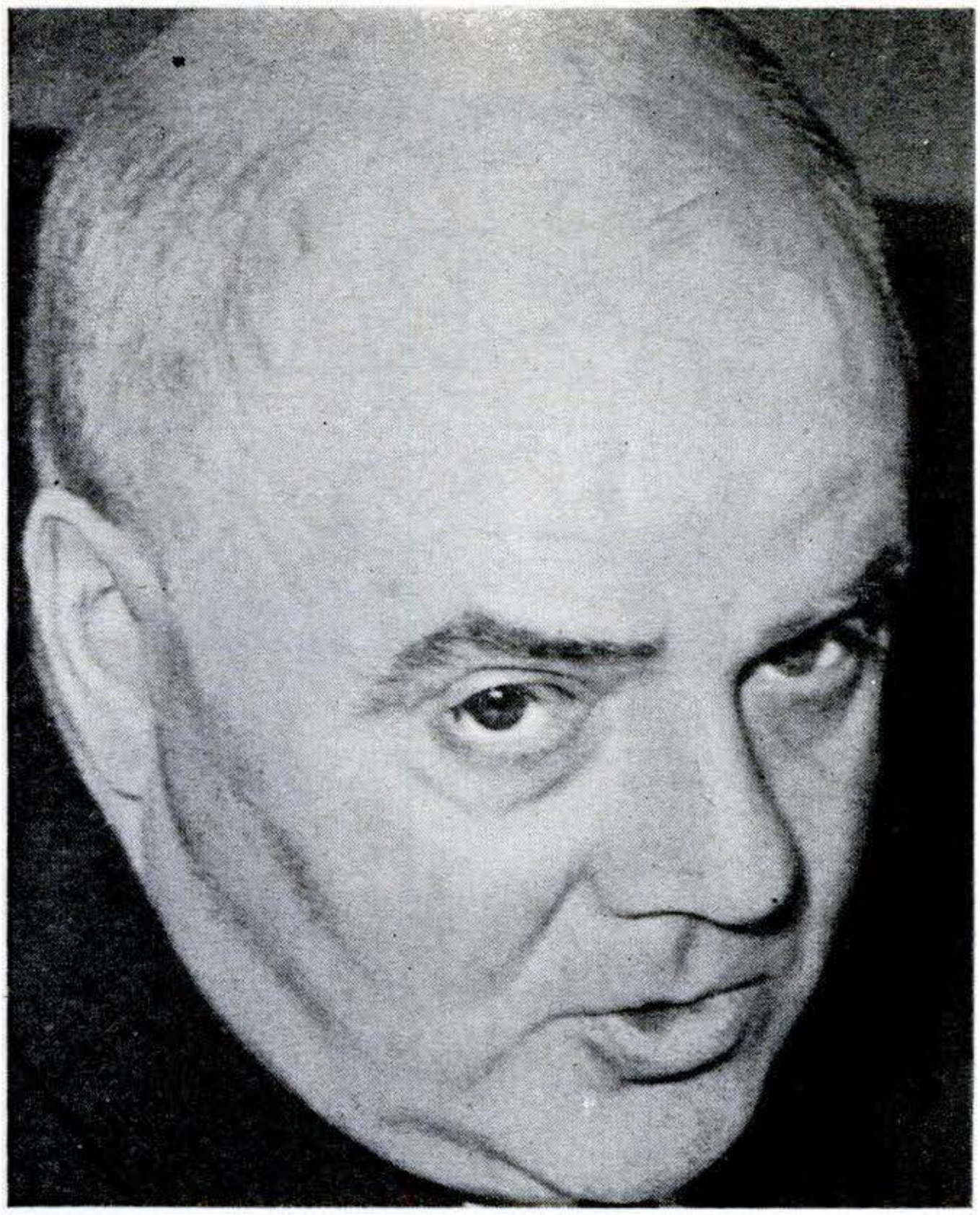
Progressive research leads to new uses for radio-electronic products and services, and to the quality you associate with the names RCA, and RCA Victor.

• • •

When in Radio City, New York, be sure to see the radio, television and electronic wonders at RCA Exhibition Hall, 36 West 49th Street. Free admission. Radio Corporation of America, RCA Building, Radio City, N. Y. 20.

RADIO CORPORATION of AMERICA

Copyrighted material



Chairman J. Parnell Thomas, House Committe on Un-American Activities.

PS
The Voice of Science

Don't Smear Science, Congressman!

THE Thomas Committee smear of Dr. Edward U. Condon won't help government recruiting of scientists. And Washington, up to our necks in science, already finds it hard to get the kind of men it needs for push-button peace.

Our government doesn't treat scientists too well anyway. First, we give them dirty and dangerous jobs—in the performance of which they can lose an eye, a hand, their lives, or their manhood. Or their reputation.

We pay them something less than they could make as chemists, physicists, or biologists in commercial enterprise.

Then we ask them, as patriots, to become slaves to secrecy. To live like slaves, under guard. To raise their families in slave quarters—some of which are nothing but government slums. And we ask them to keep secret any success they might have—success which might win them recognition or a raise in free enterprise.

These things they endure knowingly, as necessary to the high calling of their jobs.

Now, to the normal disadvantages of government service, J. Parnell Thomas has added the risk of Congressional displeasure. Of "investigations" which legalize libel. The threat of "the treatment"—a political technique which in effect suspends free speech and fair trial.

It was "the treatment" that finally broke down German science. For its impact is doubly fearful to the thoughtful men who will take their chances with the wild beasts of the laboratories, but who shrink from smirching publicity.

Dr. Condon can take care of himself in the Congressional clinches. But going into government service should not mean getting into the rough games of politics. The scientific mind can't laugh off the attacks of ambitious mediocrity.

If the Condon case is a sample of what scientists can expect in the service of our government, it is going to be harder to catch them and to keep them.

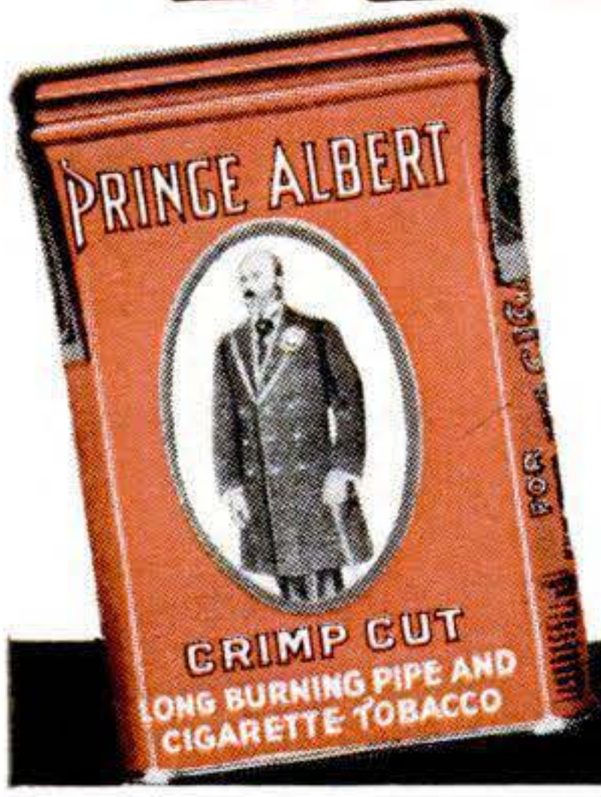
Perry Gilbreath

Copyrighted material

You're sure of a good reception when you've got P.A.*

The man with P.A. enjoys a good reception everywhere. He has Pipe Appeal—an extra attraction to the ladies. And when he has Prince Albert in his pipe—he's sure of extra enjoyment . . . real smoking joy and comfort.

P.A.* means Pipe Appeal means Prince Albert



● Prince Albert has been getting a great reception from pipe smokers all over the country for years and years. They like P.A. because it's so rich tasting . . . so mild and tongue-easy. That choice crimp cut tobacco is specially treated to insure against tongue bite. Try P.A.—and see for yourself why it's America's largest-selling smoking tobacco!

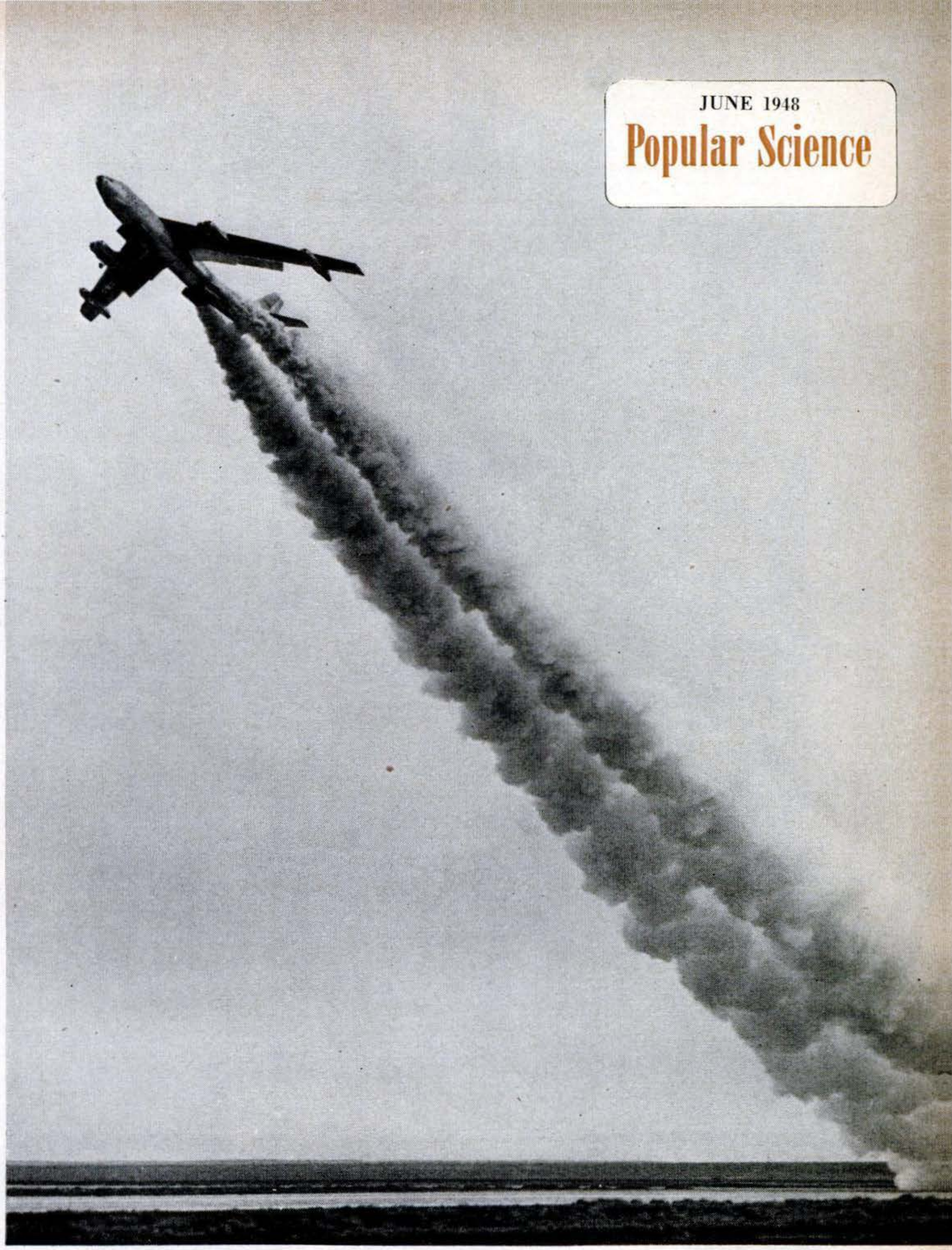
R. J. Reynolds Tobacco Company, Winston-Salem, N. C.

"GIVE ME P.A. FOR CIGARETTE 'MAKIN'S'. IT'S CRIMP CUT. . . ROLLS UP FAST AND EASY!"

THE NATIONAL JOY SMOKE

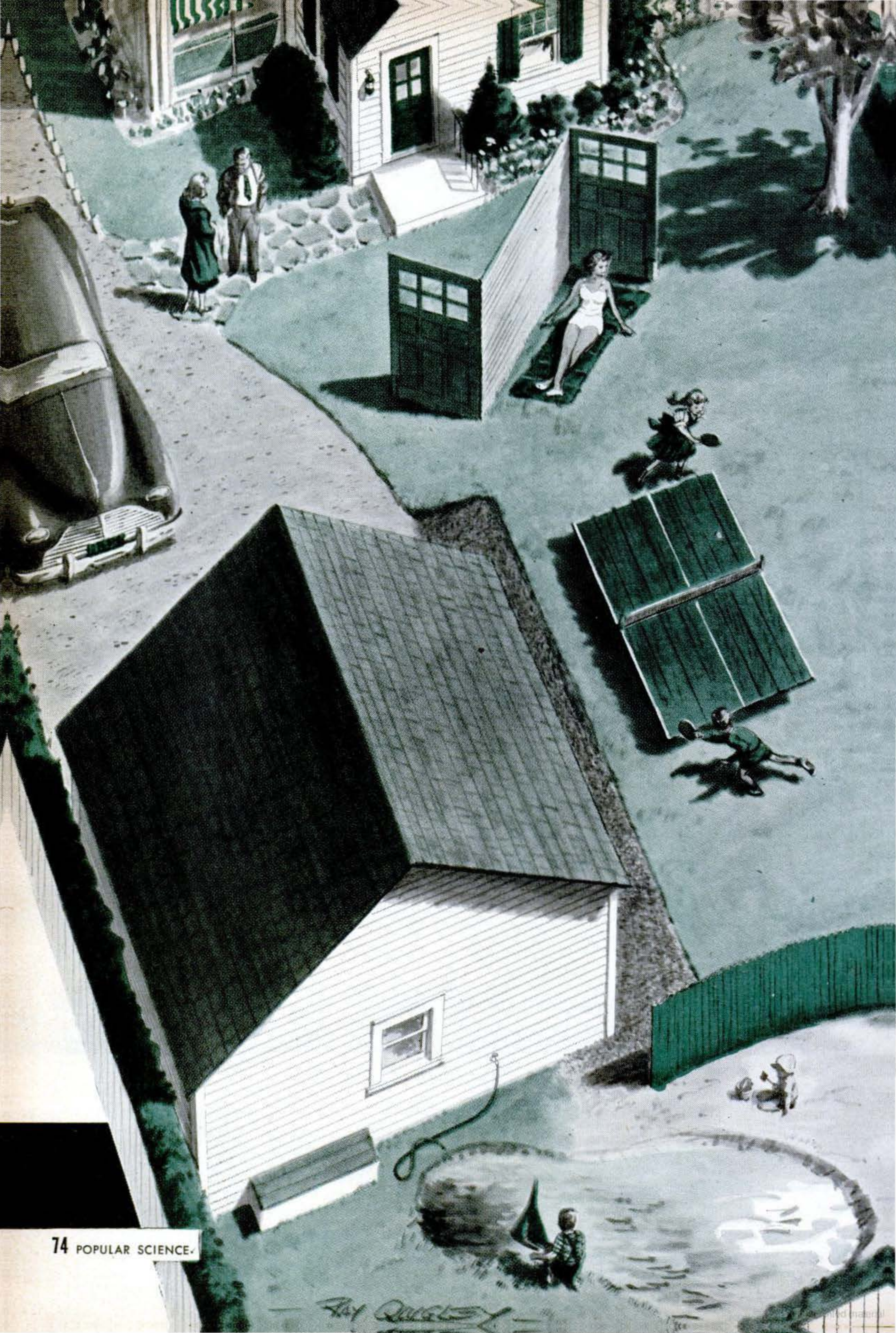
Copyrighted material

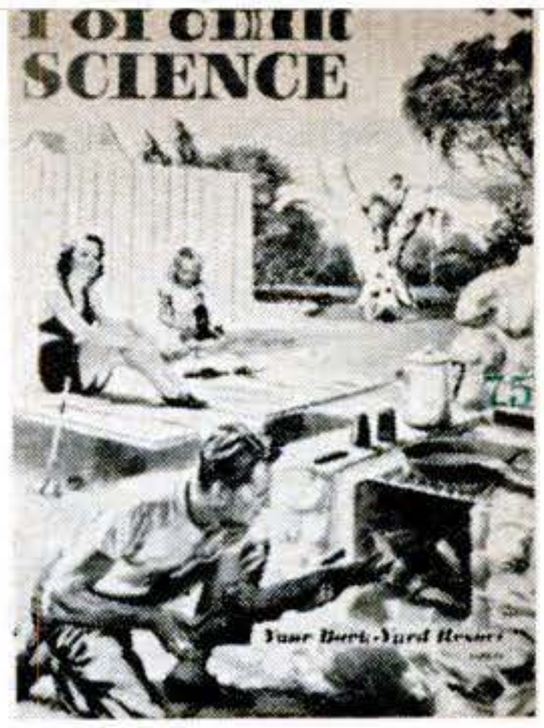
JUNE 1948
Popular Science



Going Up in Smoke... Newest Air Force bomber is shot skyward by 42,000 pounds of thrust. It's the Boeing XB-47 Stratojet, and the curving smoke trails are streaming from 18 Jato rocket units. These rockets, nine on each side of the 108-foot fuselage, are used for heavy-load take-off and for emergency power. Normal power is supplied by six General Electric J-35 turbojet engines slung beneath the sweptback wings; each develops 4,000 pounds of thrust. Other performance characteristics of this new bomber are secret.

Copyrighted material


RAY QUIGLEY



Main attractions of a summer vacation spot cost little more than your time—plus a bit of ingenuity.

Help Yourself to a Back-Yard Resort

By Arthur Bartlett

Drawings by Sigman-Ward and Ray Quigley

NOW is the time when millions of Americans are thinking of summer resorts. What will it be? Seashore? Mountains? Lake? Farm? Wherever you go, you can be pretty sure of one thing in advance: Your vacation will be all too short. You always come home wishing you could have a summer resort right in your own back yard all summer.

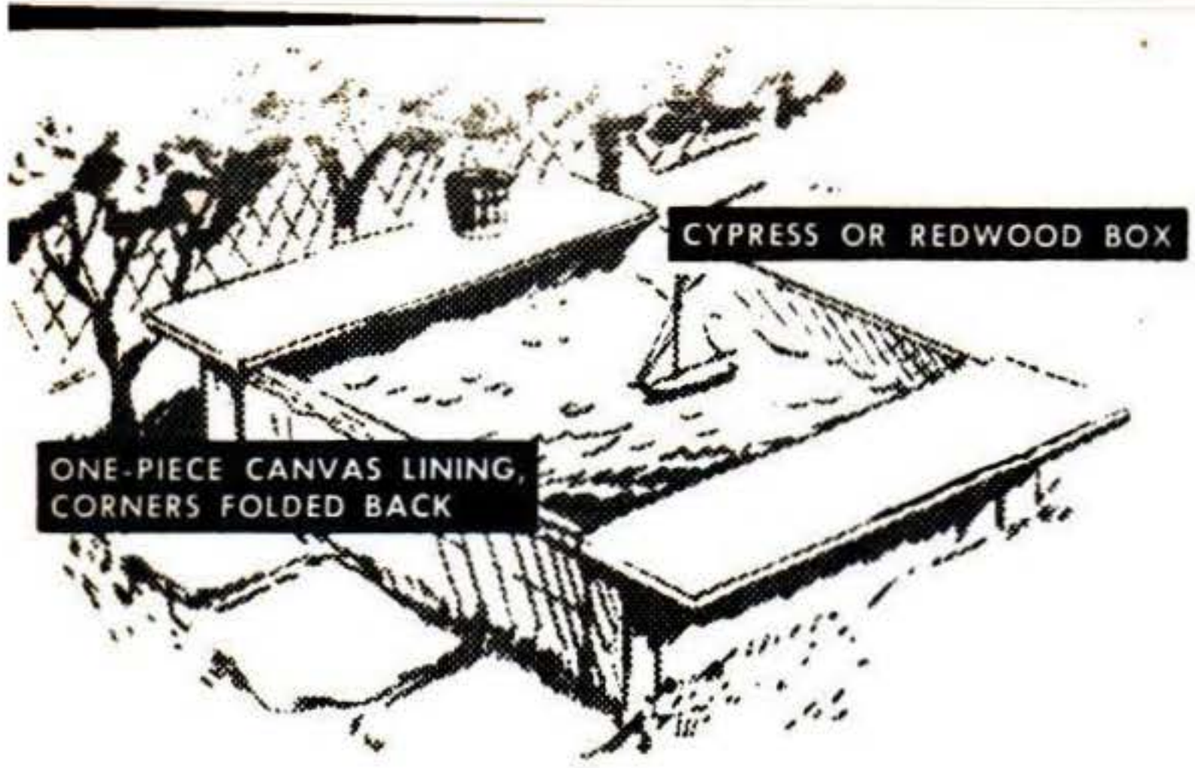
You can.

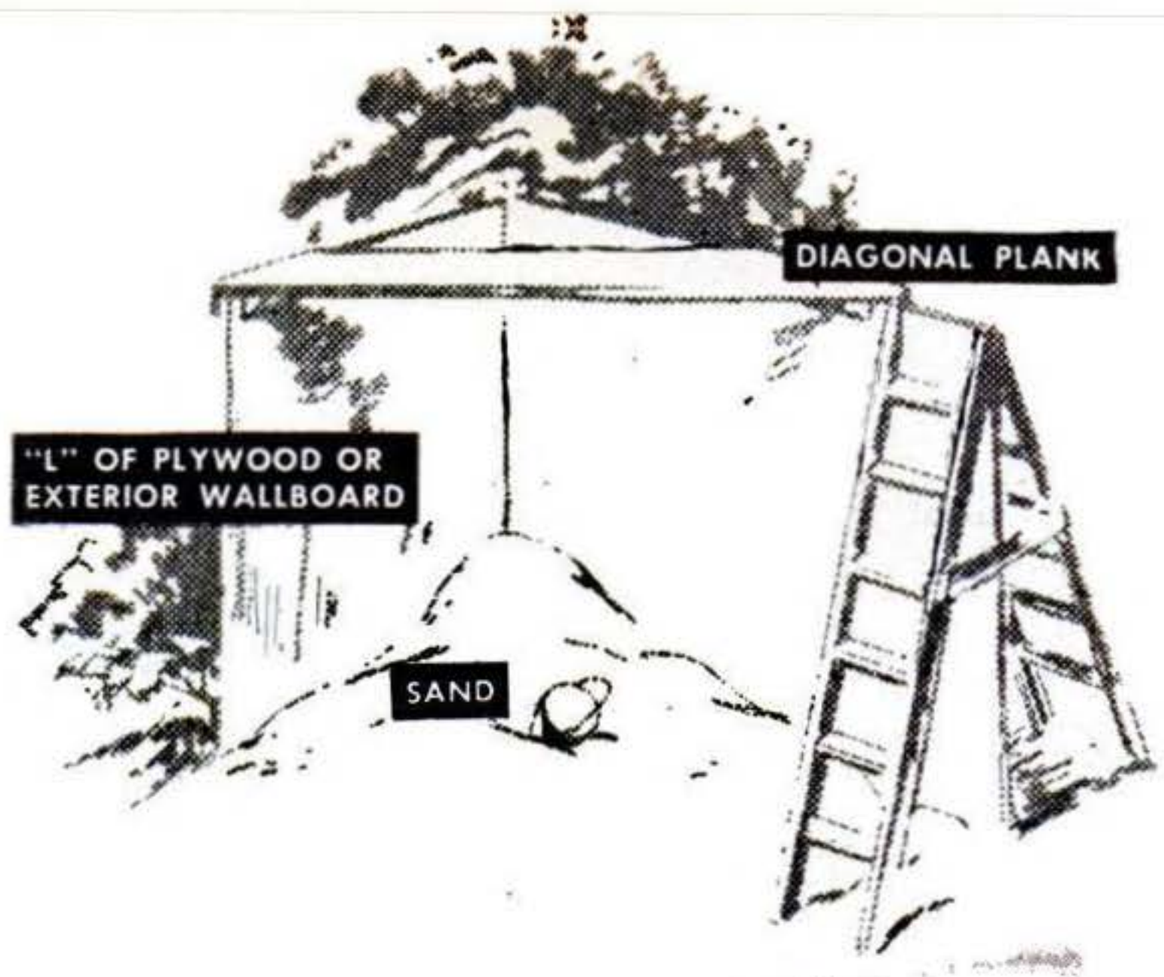
If you happen to be a millionaire, you just call in a landscape architect and a contractor and lay out an outdoor living room in the garden, a swimming pool and a tennis court, and maybe a polo field in the back forty. But you don't have to do it that way. You don't have to be a millionaire, and you don't have to have a big estate. All you need is the back yard, a few simple tools and supplies, and a little of that old American know-how. The cost can be whatever your pocketbook allows.

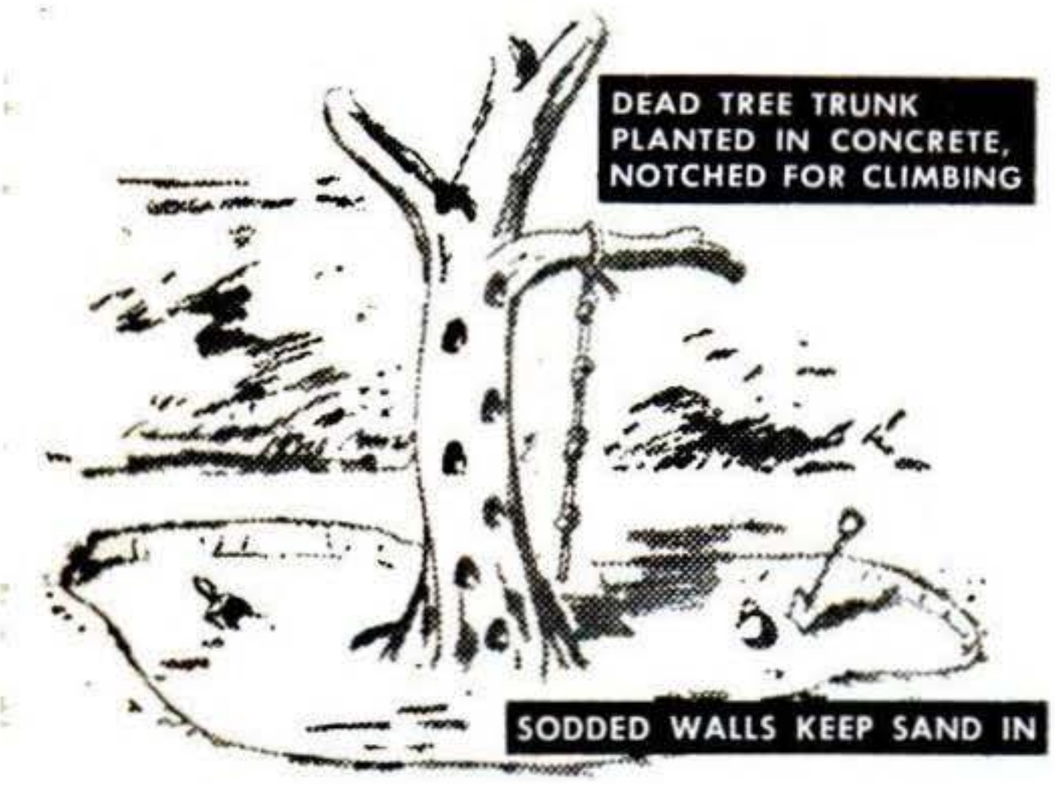
Most people putter around in their back yards, one way or another. Some have flower gardens, some build outdoor grills, some put up swings and seesaws for the children. What few people realize is that an ordinary back yard need not be just a place for Father to putter or for the children to

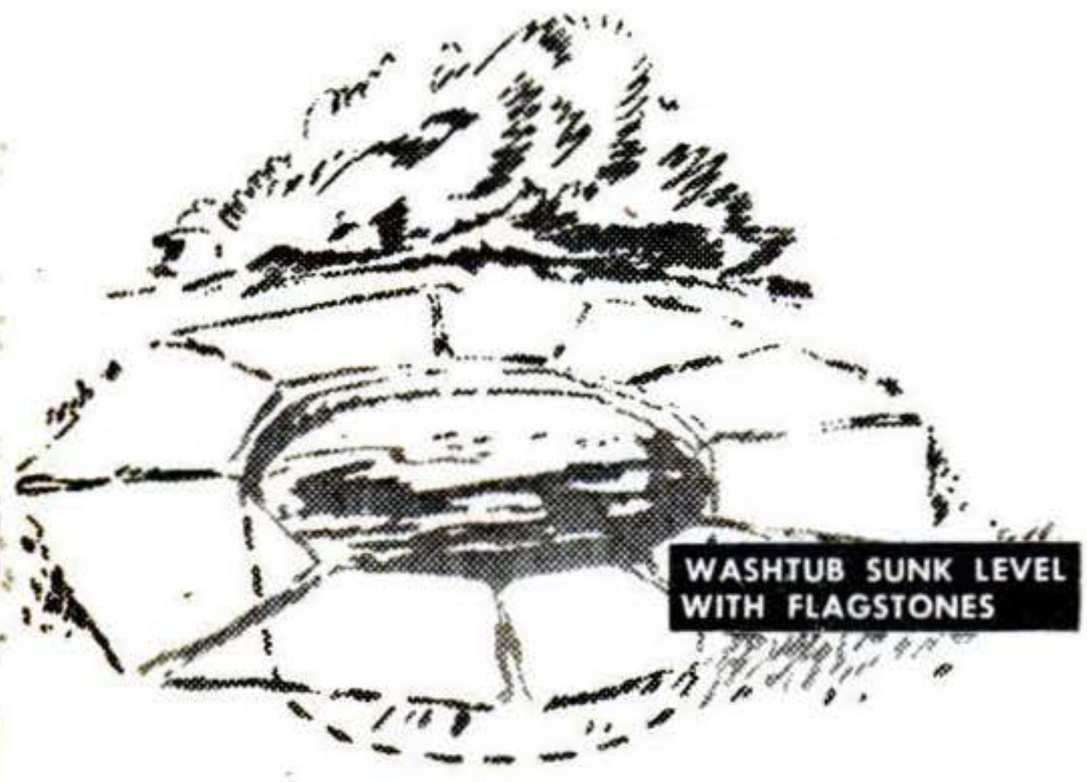
A little space, a few inexpensive materials – and a lot of ingenuity – provide the basic essentials of an outdoor summer resort at home: a place to play, equipment for cooking, tables, and screens.

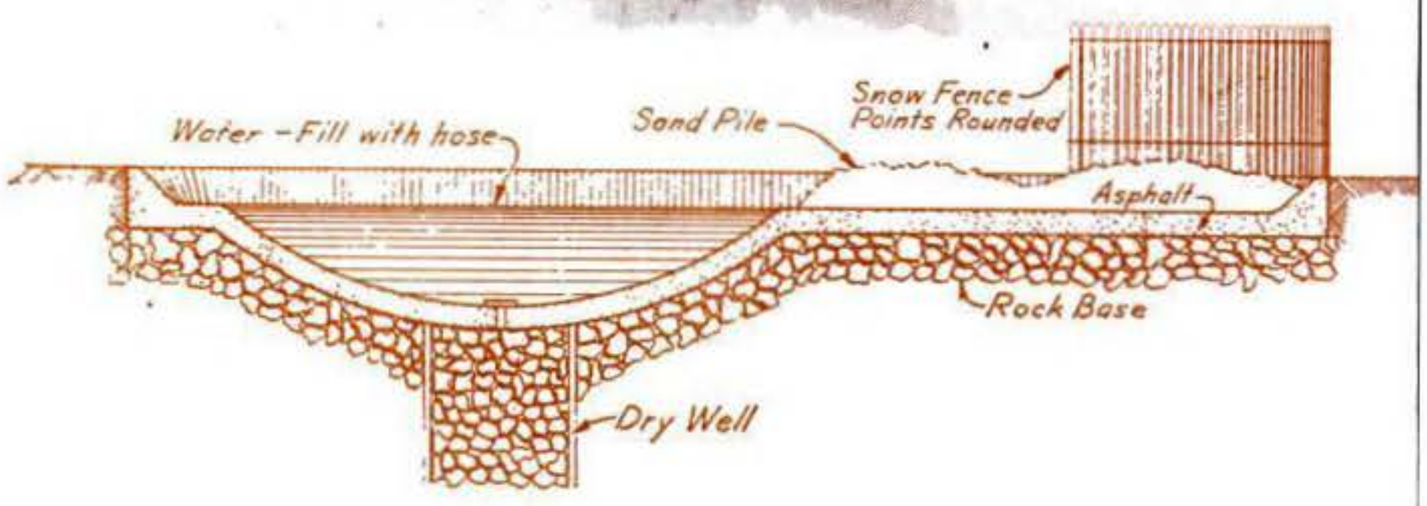
Copyrighted material











PLAY

Recreation areas and equipment of their own help to keep youngsters out of the grownups' preserve. Drawing at lower right, with cross section underneath, shows a fairly elaborate, semi-segregated playground. Tips on simpler pools, and separate sand piles with safe gym apparatus, are sketched at left and top.

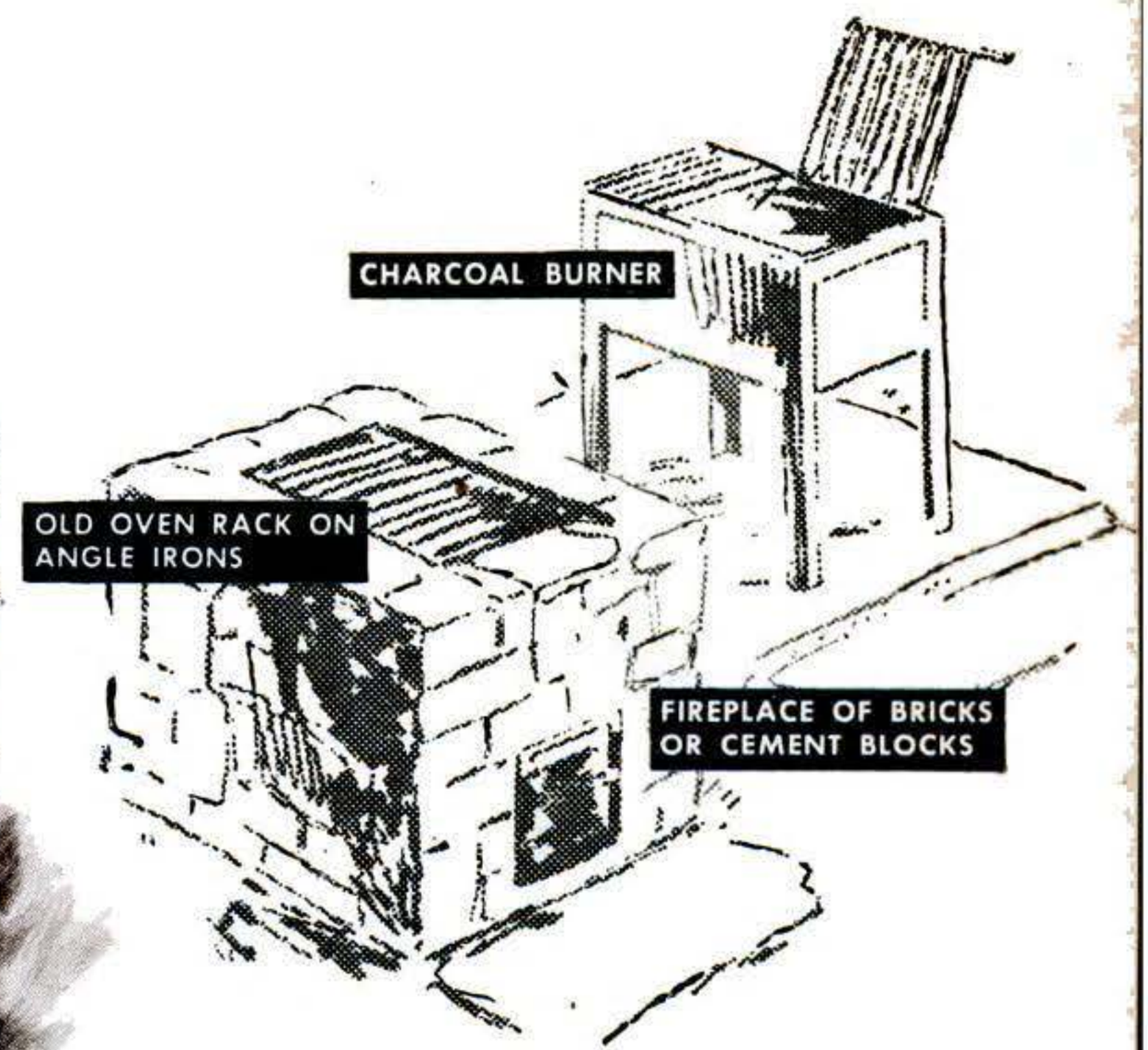
play, but can be a real, all-around summer resort for the whole family.

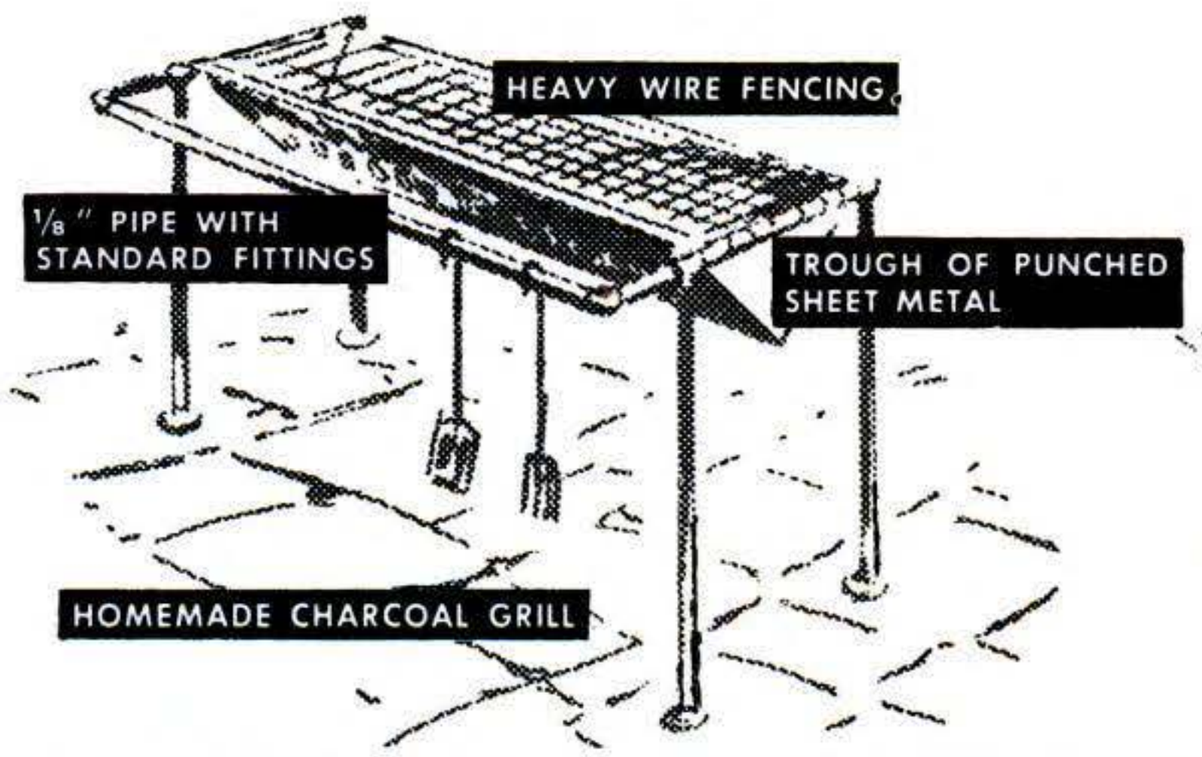
To prove this point, POPULAR SCIENCE asked me to analyze some typical summer resorts, and I waded through enough advertising literature to stock a travel agency. After boiling down to its simplest terms everything that the average summer resort has to offer, I can now report that you can have all the ingredients of a summer resort in your back yard with the aid of (1) a fence, (2) a cooking unit, (3) a platform, and (4) some water.

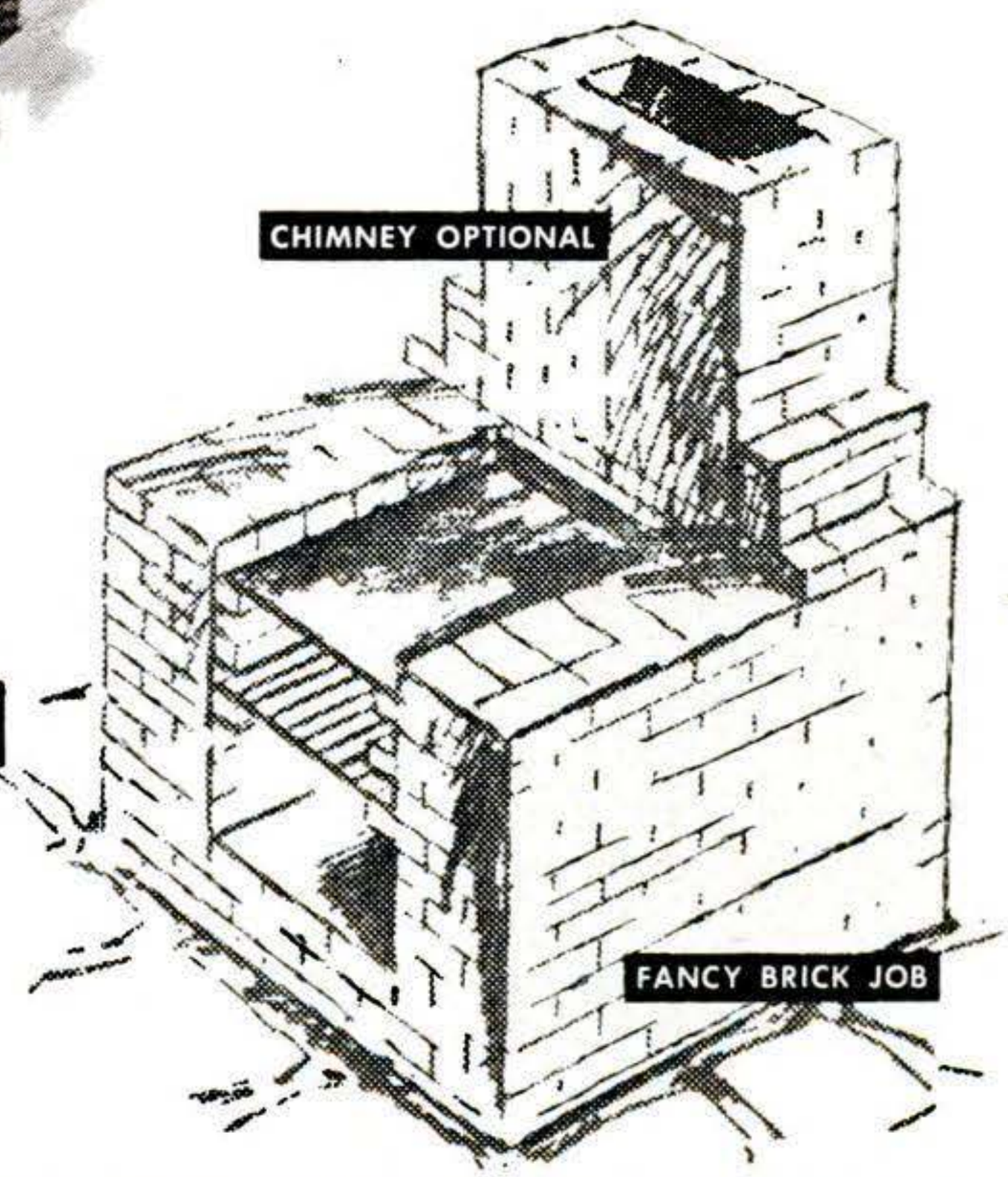
They form the basic resort pattern.

Of course, you can't move the ocean or a mountain into your back yard. For that matter, you can't go surf bathing at a mountain resort, or mountain climbing at the

Copyrighted material







COOKING

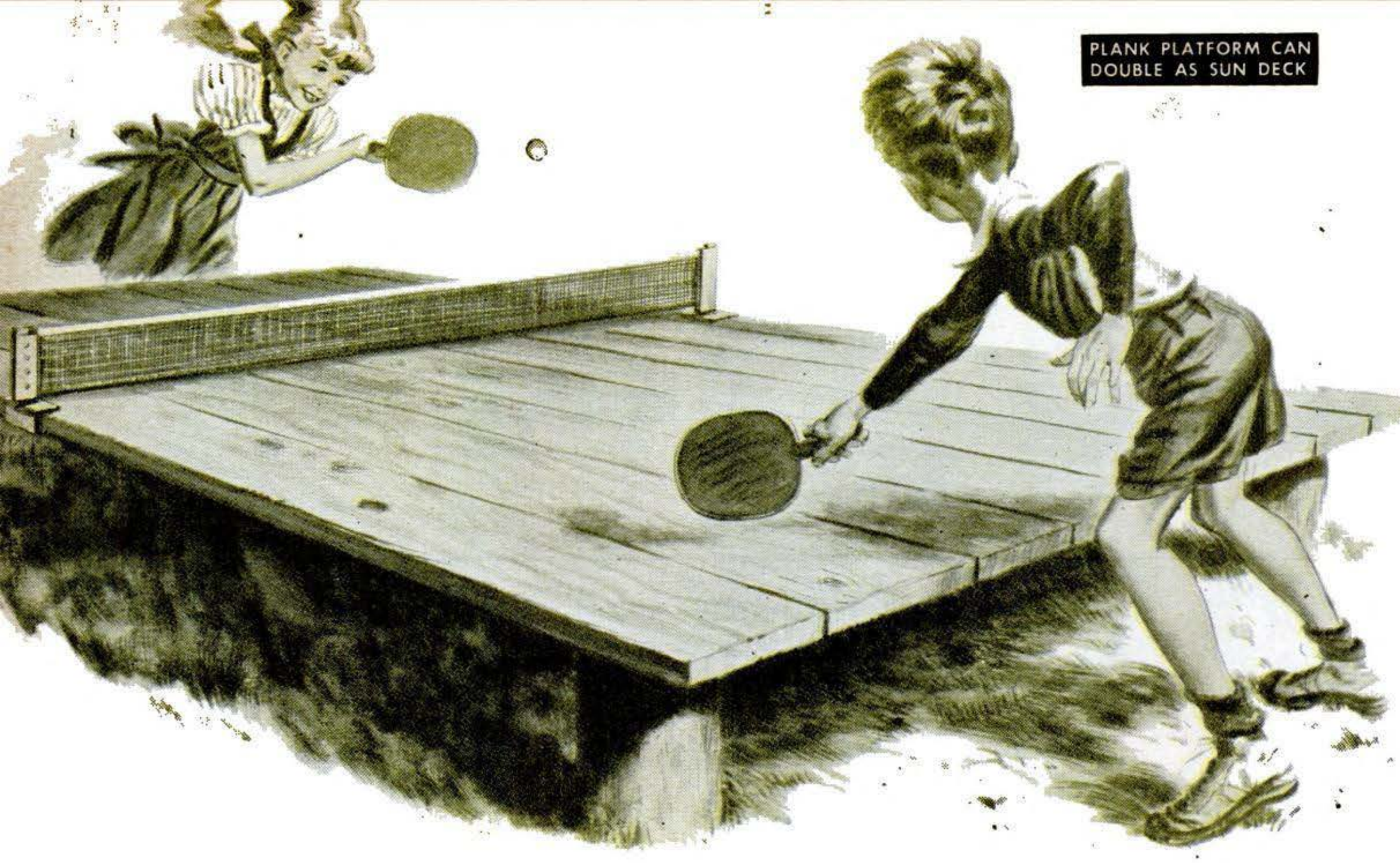
Outdoor stoves run the gamut of taste and cost from homemade charcoal grill to custom-built brick fireplace. Something in between is shown in the larger drawing. Since the rough-cut stones aren't mortared, it wouldn't need a foundation. Cooking rack is an old refrigerator shelf.

beach. But we are talking about the basic ingredients of a summer resort. No matter what kind of a resort you choose, you will find ways to relax and have fun, and they all fall into a definite, regular pattern. You can apply the same pattern to your own back yard.

Suppose, for instance, you have a small back yard, partly open to the street, or backed up to a neighbor's property, or exposed to a view of tin cans or something else that doesn't rate high among the beauties of nature.

Well, the first essential in the resort pattern is that it must be a place where you can relax in pleasant surroundings. You can't take sun baths, or lounge around in old or scanty attire, with curious people

Copyrighted material



staring at you—not with any comfort, any way.

Hence, the fence.

The fence gives you privacy, and it can also give you something pleasant to look at —which is part of the pattern. One of the simplest ways to achieve this double purpose is to get some colorful canvas—the kind used for awnings and deck chairs—and put it up on iron pipes. If you want to screen off the view from upstairs windows, a canvas awning, on a framework of iron pipes, can be added. This would also provide a shady spot, though for that purpose alone an ordinary beach umbrella might be enough.

Porch Shade or Vines as Screen

Another easy way to screen out prying eyes and unattractive sights is to use an ordinary split-bamboo porch shade, setting it up on its side, and attaching the ends to corner posts or to buildings.

Simple plantings make a particularly attractive screen, and do the job permanently —an evergreen or privet hedge, for instance, or a trellis or arbor with climbing vines or roses.

In a larger yard you can carry the screening a step farther, and divide one part of your resort from another. A split-bamboo or canvas screen can mark the bounds of the children's department, and leave the rest of the yard dedicated to peace and quiet. Or an attractively planted screen can enclose that part of yard which is to serve as an outdoor living room.

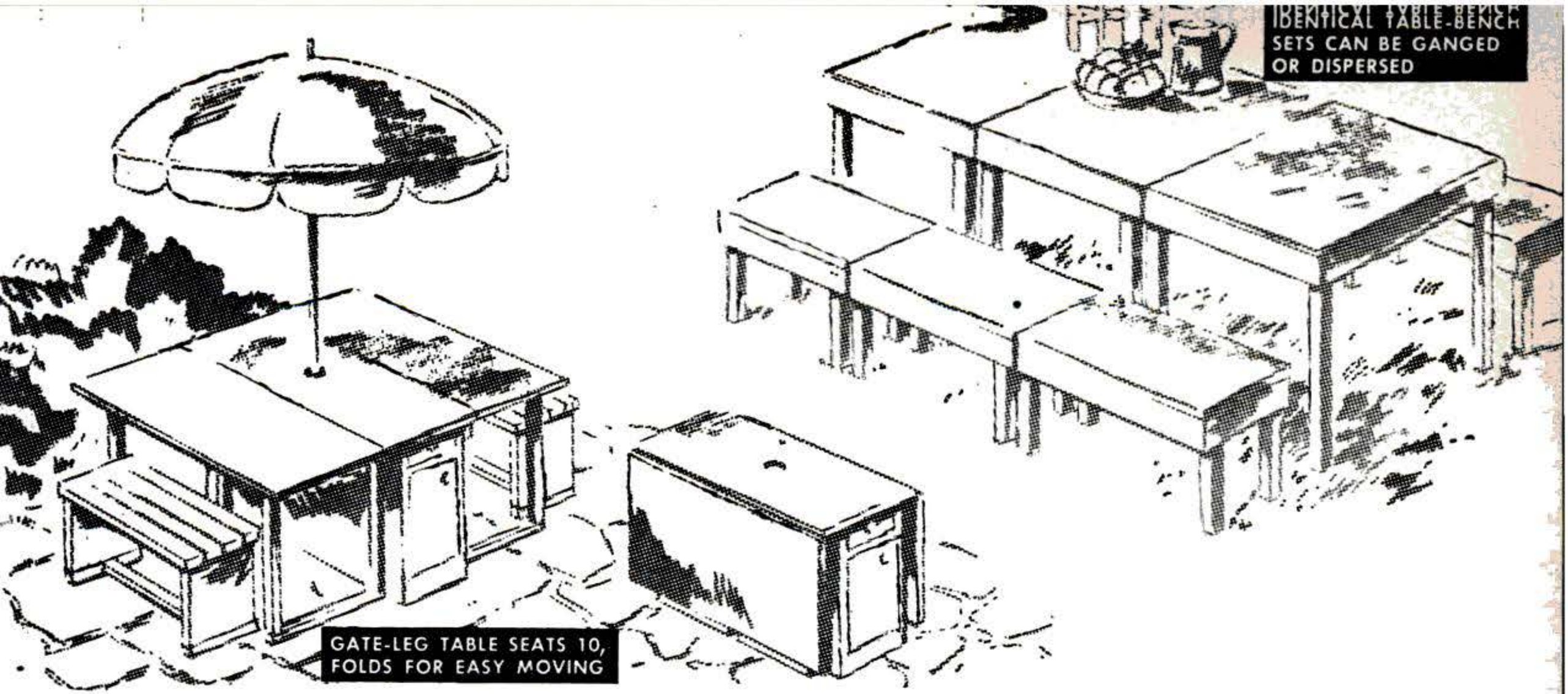
But there is more to a resort, of course, than just the external surroundings. The pattern includes pleasant change from the daily routine of life. That is where the cooking unit comes in.

It doesn't have to be an elaborate installation. That's up to you. But something to cook on outdoors makes all the difference between living as if you were at a resort and just plain living. It gets Mother out of the kitchen. It gives Father a chance to prove a man's outdoor artistry with hamburger—or with a thick steak if he is feeling flush. It makes a meal into a picnic for the youngsters. It makes the back yard, as the saying goes, a place to Get Away From It All.

Popular Science has published, from time to time, many suggestions and directions for building outdoor fireplaces and barbecues. Some of them are so simple that they take little more skill than being able to put one brick on top of another. If there happens to be a conveniently placed boulder in the yard, an adequate fireplace can be constructed simply by laying up stones or bricks against it, to form the sides, and putting a grill—a long-handled broiler or toaster, for instance—across the top.

You don't even have to go in for masonry

Copyrighted material



TABLES

If you want a table just for eating, take one of those above. They're light enough to move around and, with tops of waterproof plywood, can stay out in the rain. For more versatility there's the model on the opposite page, permanent but sturdy enough for games and sun bathing.

at all. A Wisconsin summer resort, as reported by POPULAR SCIENCE some years ago, used all-metal fireplaces made of 12-gauge steel, welded into a circular shape, with a cut-out opening for the fire door and concrete-reinforcing bars welded to the top to form a grate. Similarly, a charcoal stove might be fashioned from a five-gallon oil can. Even a canned-heat burner will serve as an outdoor cook stove, in the lack of any thing else.

If your fireplace is of rigid construction, you'll have to put it on a footing that runs down below the frost line to keep it from heaving and cracking in the winter. If made of loose blocks or stones, it needs no foundation.

Smoke Needn't Be a Nuisance

In spotting the fireplace in your back yard, figure out the line the smoke will take with the prevailing *fair-weather* wind. Smoke in your eyes is a preventable annoyance, and a smoke column carried into your neighbor's open windows will win you no friends.

If you plan to burn wood, don't build the fireplace under trees; branches even a dozen feet above the fire will ultimately scorch and die. Also, downdrafts from trees—or nearby buildings—often will cause smokiness. Use of charcoal eliminates the smoke and scorching problems; its disadvantage, as compared with wood, is visual: you can't gaze with pleasant melancholy into the dying embers of a charcoal burner.

The next item in the resort pattern is that it must be a place where you can do things and have fun. We'll assume that you haven't room in your back yard for a polo field or tennis courts. It can still be a resort, if some kind of sport is available.

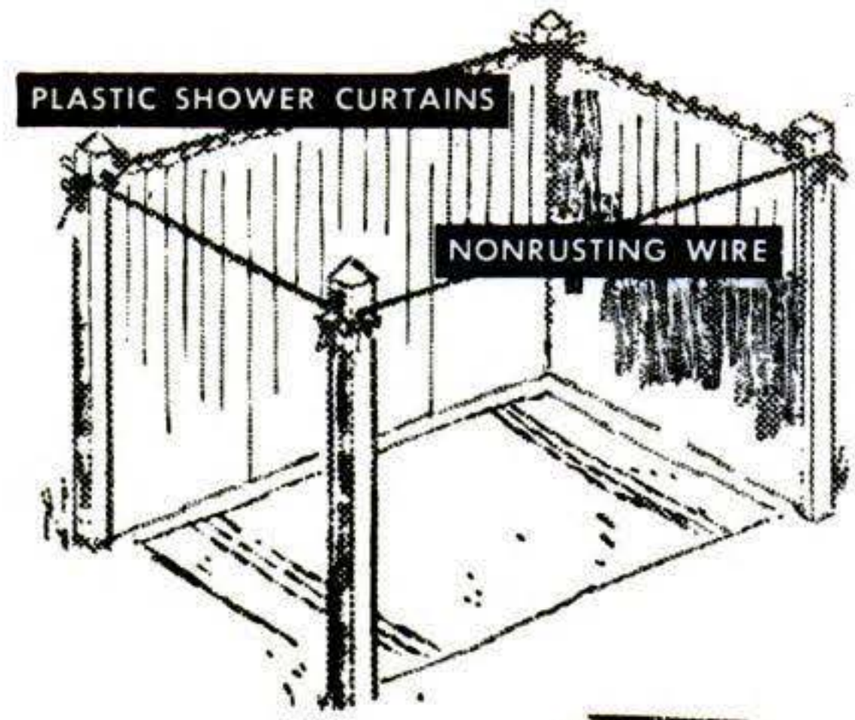
Table tennis is one answer. You can play that even in a small yard. A regulation **table-tennis table is 9** by 12 feet, but it can be—often is —smaller, just so it's kept in proportion. All that's needed is a strong wooden table with a smooth top painted green and marked with white court lines. It can be constructed right in the back yard and, with waterproof plywood for the top, be left there all summer in any weather.

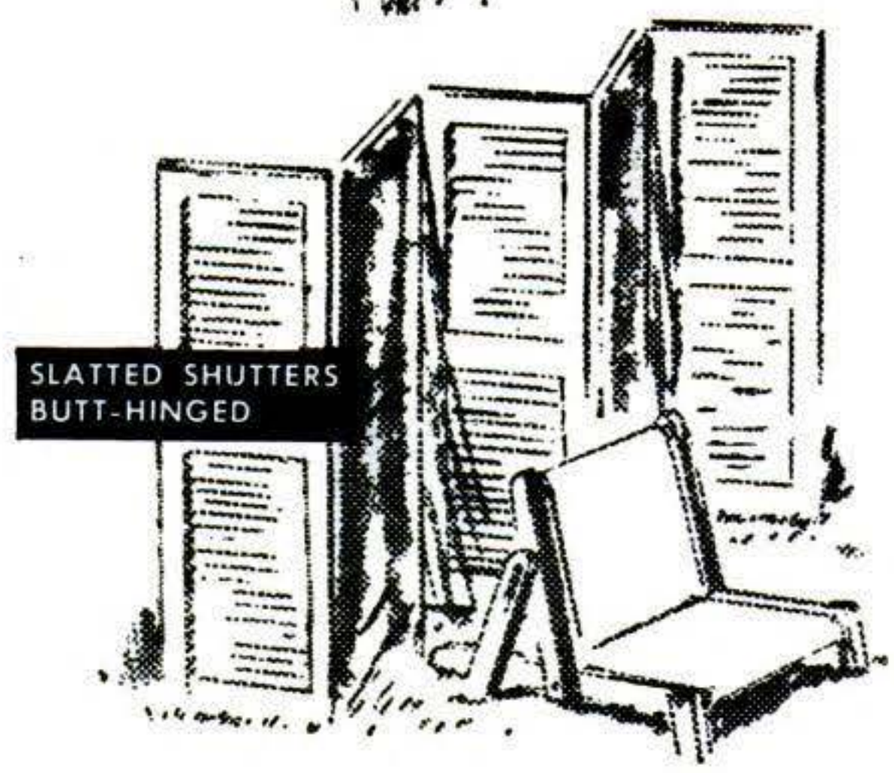
For Eating and Sunning

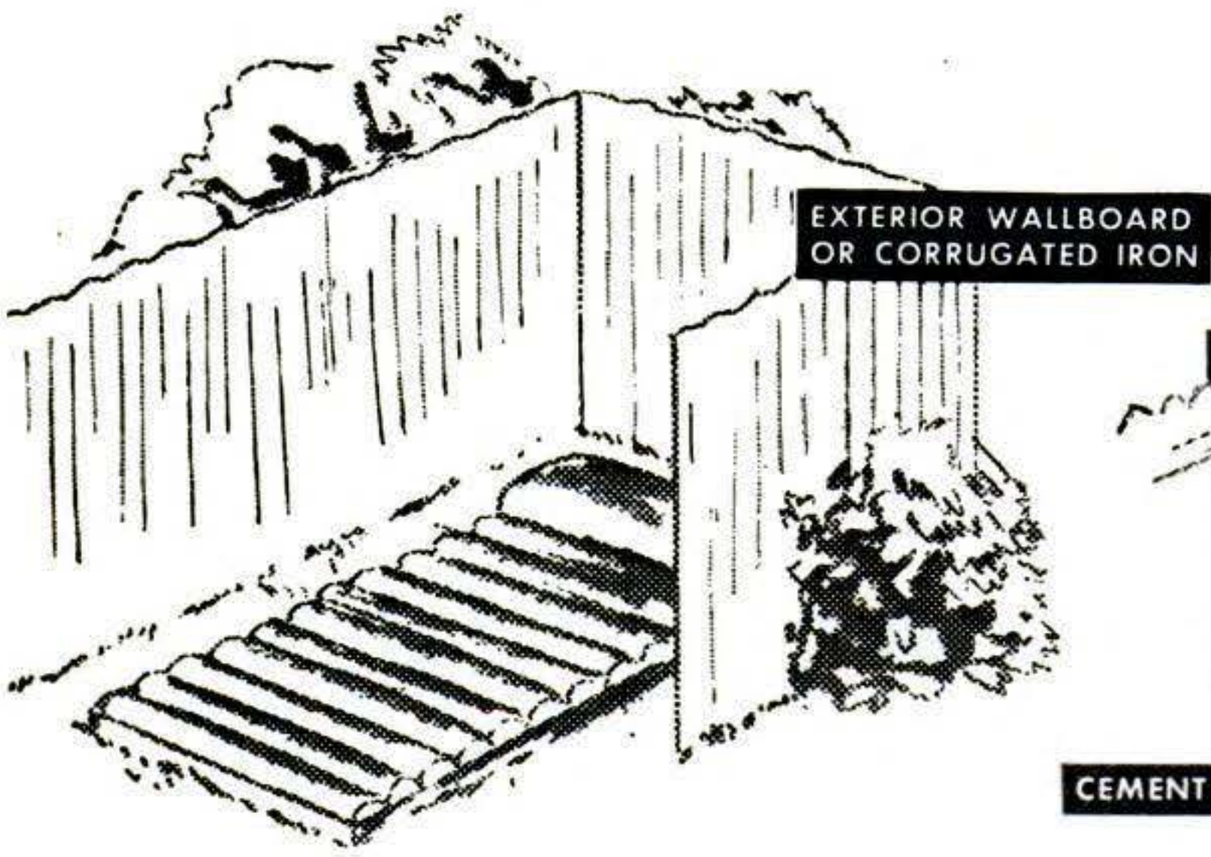
What is more, you then have not only an answer to the desire for sport and exercise —and, believe me, table tennis can be vigorous—but a table around which to gather for the food from that outdoor stove. Father can invite his friends around it for a game of cards or a cool drink in the fresh air. And if Mother (or anybody else) wants to stretch out in the sun and get a tan, without lying on the bare ground, there it is, as smooth as the beach itself.

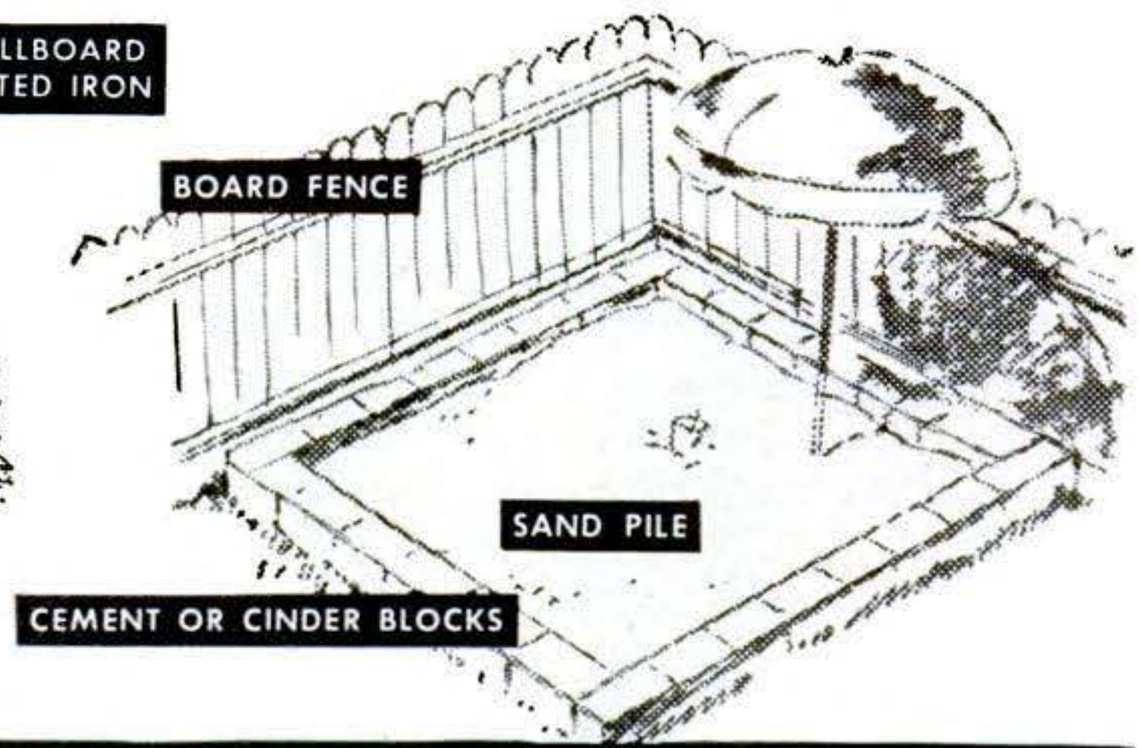
If you have enough space, a larger plat-

Copyrighted material









SCREENS

These are some of many ways to shield areas from wind and outside view. Even a small screen provides a visual shadow big enough for sun bathing if you keep low and close to it. Larger fences can be made of flexible plastic molded on chicken wire.

form will serve for paddle tennis and deck tennis—and provide even more room for sun bathers.

The bigger platform, raised a foot or so from the ground, can also double as a picnic spot. It will accommodate a flock of sitters, and give them plenty of room to set things down beside them. And if some of the younger generation want to bring out the phonograph and dance, there is their open-air dance floor.

For the small fry, swings, seesaws, and sand boxes are obvious attractions; but the resort is not complete and according to pattern until there is some water for them to paddle in. That is easily provided. I know a man who salvaged an old bath tub, dug a hole to sink it in the ground, set some rocks underneath to let the water run off when the plug was pulled, filled it with water from a hose—and never had to worry about entertaining his youngsters for the rest of the summer. They never tired of sliding in, splashing around, and climbing out to do it all over again.

That is only one way. If you don't know

Copyrighted material

where to lay hands on an old bathtub—and they are scarce these days—a piece of canvas lining a hole in the ground will do. Or, as suggested in a recent issue of POPULAR SCIENCE (July, '47), a surplus warplane wing tank, which can be picked up for about $5, can be made into an excellent wading pool. Even simpler is buying a one-man life raft, inflating it, and filling it with water. A similar pool can be made by cementing an inflated inner tube to rubber sheeting.

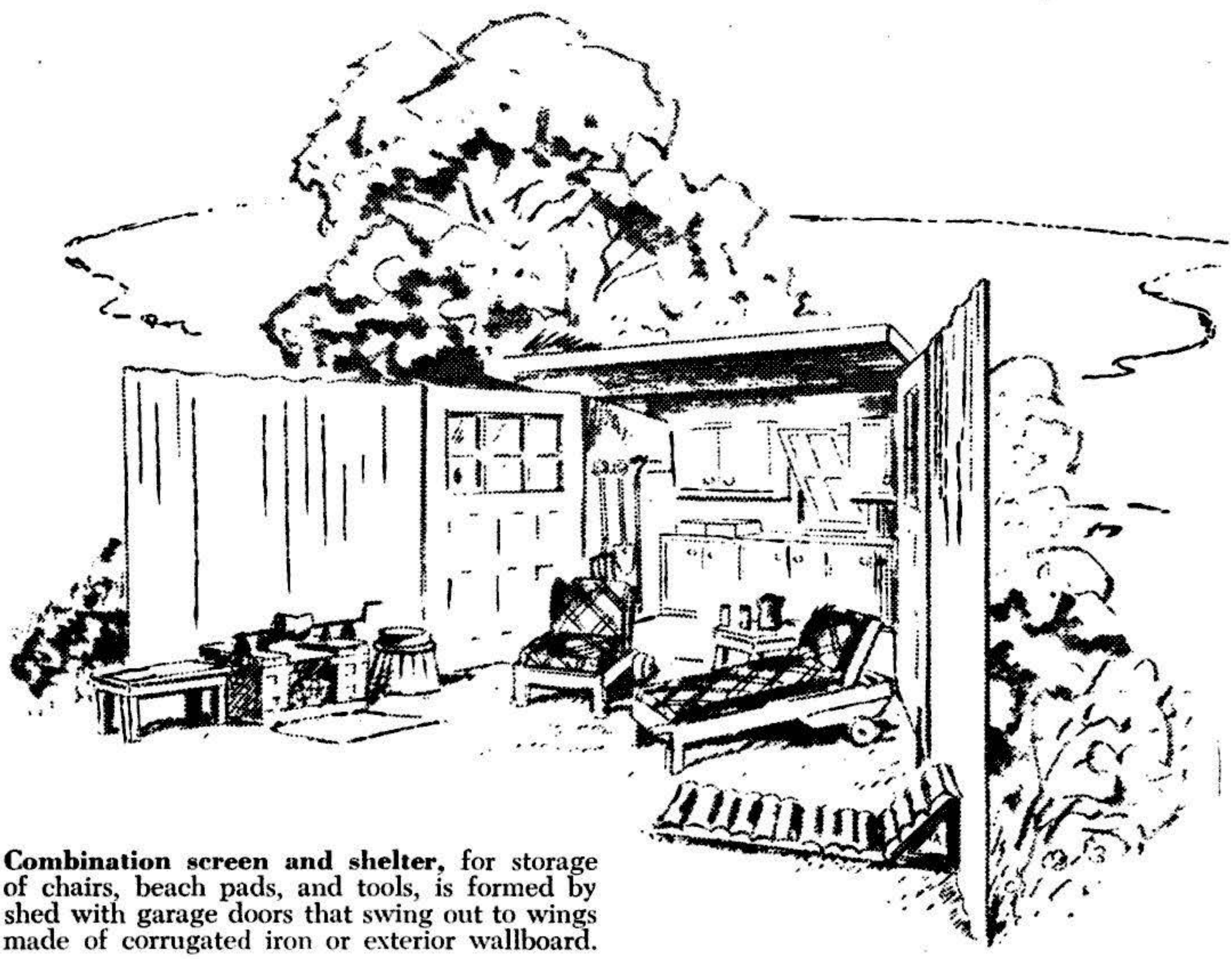
From such a splash pool as a minimum, one might go as much higher in the scale as ambition, skill, and finances may dictate. You can build anything from a shallow wading pool to a full-fledged swimming pool of concrete reinforced with chicken wire.

A sand pile may adjoin the wading pool as a beach or, depending on the shape and layout of your yard, be located near by. Even if your kids sunburn easily, it's wise not to put it in the shade of trees: it will stay soggy too long after a rain, and fallen leaves or needles will soon dirty the sand. Better put it in the sun, and shade the youngsters when necesary with a beach umbrella or awning.

An outdoor shower is still another way to fulfill the water requirement of the resort pattern—and one which many oldsters as well as the youngsters would appreciate. So long as there is a water connection in the yard, this is no problem, You can, of course, install as elaborate an outdoor shower as you like, but a simple tripod to hold the hose nozzle up in the air and send a spray of water down on you will do. So, indeed, will a bucket with holes in the bottom.

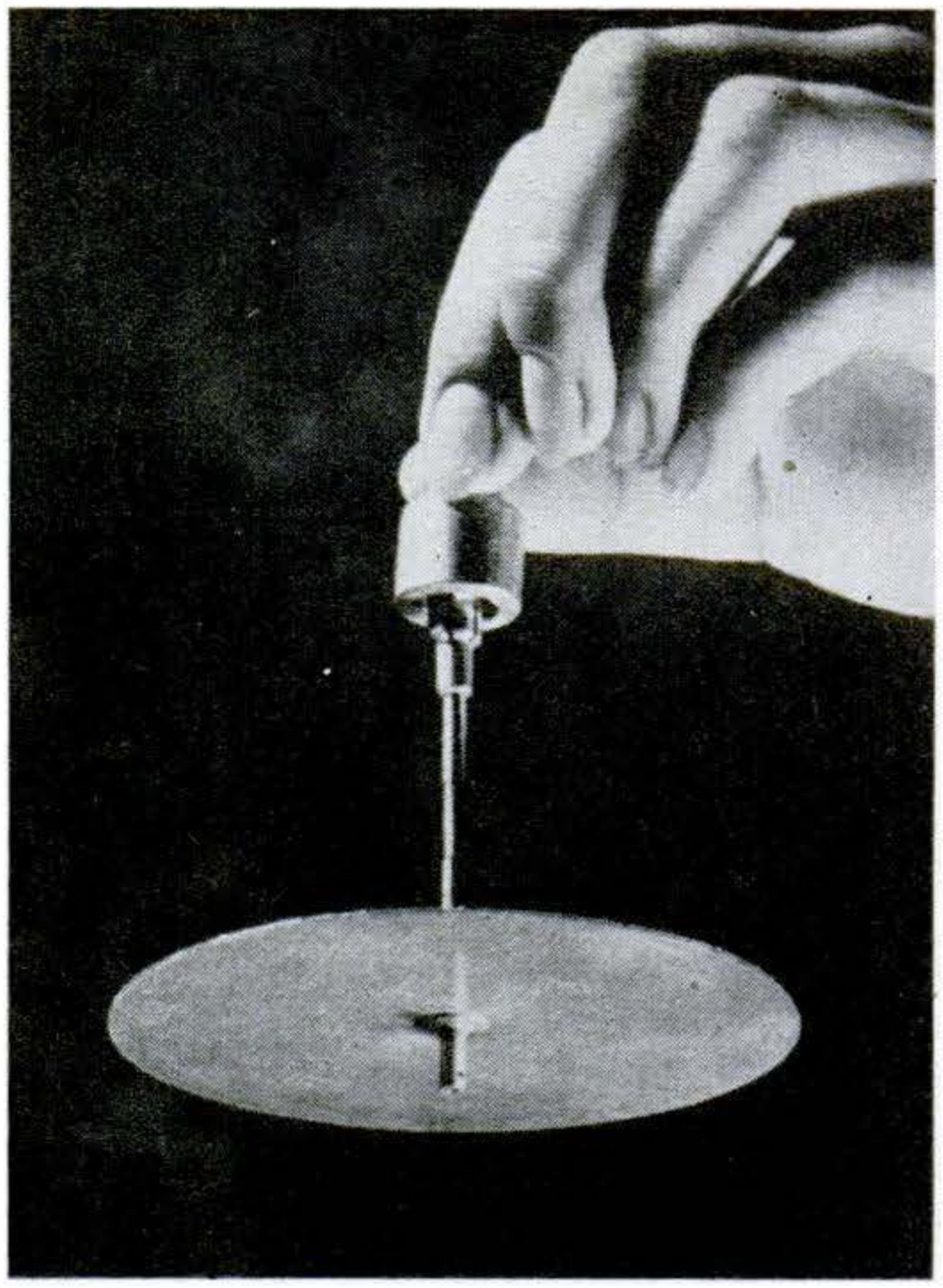
There you have the pattern, in its simplest form. Variations and elaborations of it, to fit individual preferences and circumstances, are left to your own imagination and ingenuity. You will probably want various items of outdoor furniture. You may want to string lights into the yard, so you can use it evenings. If so, you will surely want to include one of the bug lights now available to lure the insects into annihilating themselves.

Just take a good look at that back yard. Paste in your hat those four points of the pattern—fence, cooking unit, platform, water—and consider how they can best be combined to meet your own family requirements. You *can* have a resort in your back yard. And you will wonder why you never did before. END



Combination screen and shelter, for storage of chairs, beach pads, and tools, is formed by shed with garage doors that swing out to wings made of corrugated iron or exterior wallboard.

Copyrighted material



New Floating Bearing Will Last Lifetime

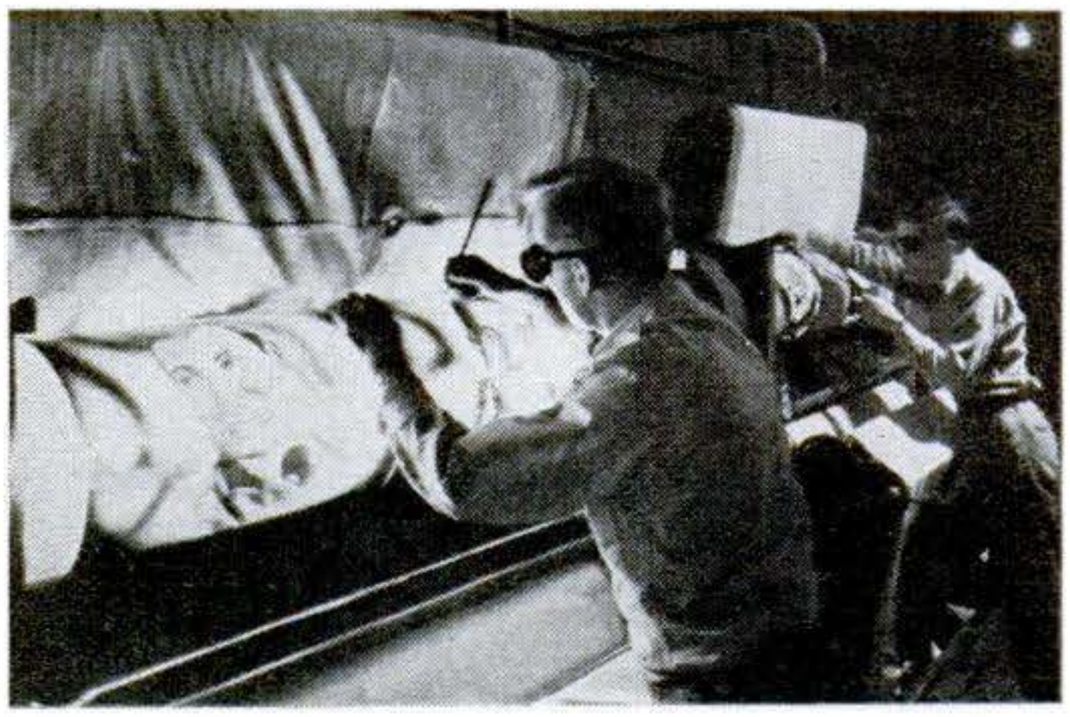
A ROTATING aluminum disk suspended in mid-air by powerful permanent magnets forms the key part of a new, radically improved GE electric meter. Virtually frictionless, this "magnetic suspension" replaces jewel bearings whose wear formerly required periodical servicing. The result is a lifetime of accurate readings with minimum maintenance.

In the new meter, the aluminum disk is the rotor of a rudimentary electric motor, which turns the indicators at a rate proportional to the quantity of power being used by the consumer. The rotor shaft of the new "Type 1-50" meter (left, above) ends in a tiny cylinder of new machineable magnetic alloy of copper, nickel, and cobalt. This fits within a thimble-shaped fitting of the same alloy attached to the meter frame. Both pieces are highly magnetized, and the interaction of their magnetic fields supports the entire weight of the rotor, as shown above at right. Stainless steel and pure carbon, in a guide that prevents sidesway, all but eliminate friction at the only contact between rotor and frame.

The "magnetic suspension" type of bearing is expected to find wide usefulness. As this issue went to press, announcement was made of its application by Prof. J. W. Beams, University of Virginia physicist, in an ultra-high-speed rotor that spins in a vacuum at 633,000 revolutions a second. This device may be used in the mechanism of rockets and guided missiles, as well as for high-speed laboratory centrifuges.

Photos Print on Cloth

PHOTOGRAPHS can now be transferred directly to fabrics, revolutionizing the ancient art of cloth printing. The technicians at right are attaching transparencies to the glass rollers of the new "press." Mercury-vapor lamps inside the rollers transmit the image to cloth, dipped in light-sensitive dyes, which then passes through developing and fixing baths. The Photone ⓣ process is said to produce softer tones than older methods.



Copyrighted material

Magnetic Oil Holds New Clutch Tight

This new clutch developed to feed an electronic computer may take the jerks out of driving an automobile.

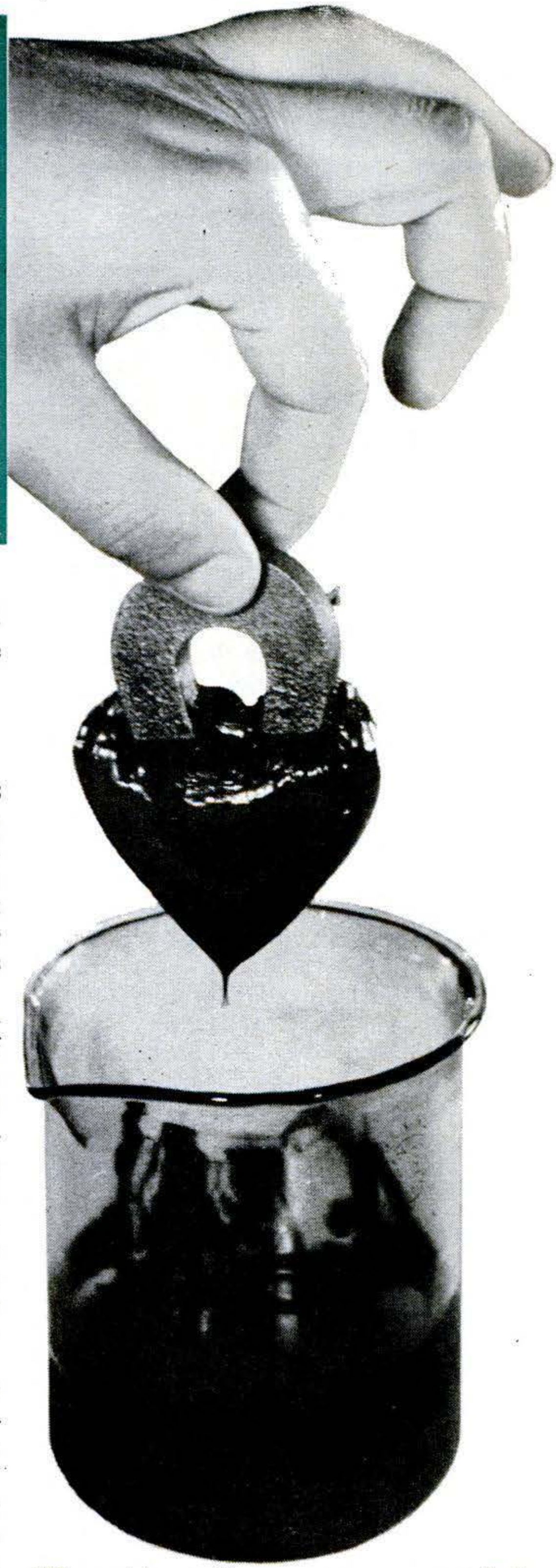
By John F. Loosbrock

THE problem Jacob Rabinow faced was how to satisfy the appetite of a giant electronic computer that gobbles facts and figures at incredibly high speeds. To solve it, he has produced a versatile device that may also take the jerk out of automobile driving and automatically push the buttons in a push-button war.

Rabinow is chief of the Ordnance Mechanics Section of the National Bureau of Standards in Washington. The Bureau currently is working on a complex electric brain, the Electronic Discrete Variable Automatic Computer. Information is fed into this device on magnetic steel tape pulled along by rollers coupled to electric motors. Since the computer can digest a million magnetic impulses a second, the tape must reach top speed as quickly as possible after the mechanism is turned on—otherwise valuable time is lost.

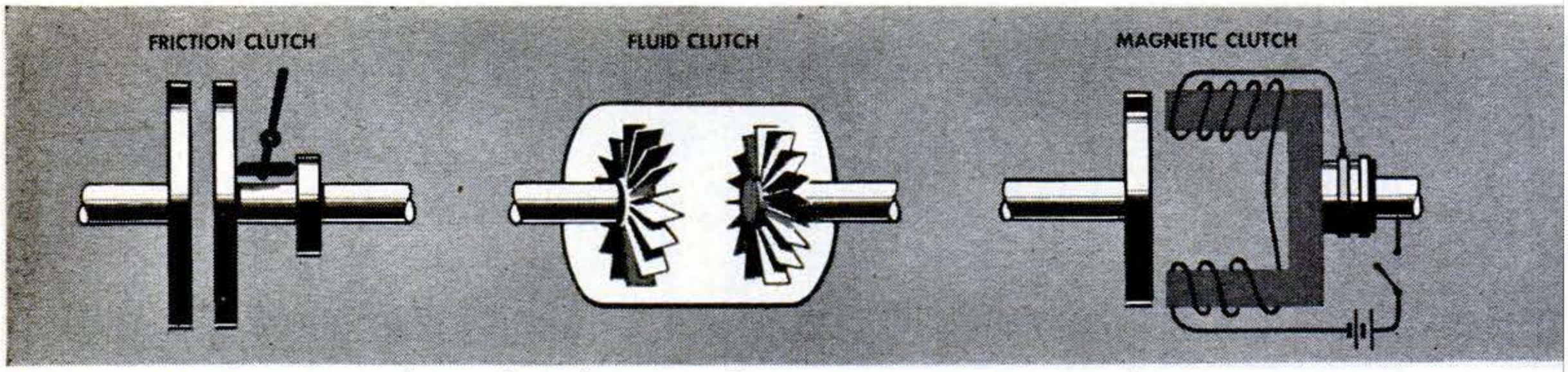
Rabinow's job was to design a clutch that would couple the motors to the rollers almost instantaneously, without jerking at the start or slipping at high speed.

Research led him to an electrostatic clutch invented by a man named Winslow. Winslow's clutch (shown in a diagram on page 85) utilized tiny particles of ordinary starch suspended in oil between two metal surfaces. It was a good clutch, but



When this small permanent magnet is immersed in a mixture of powdered iron and oil, the "gunk" solidifies and adheres to the magnet. This principle led to the magnetic fluid clutch.

Copyrighted material

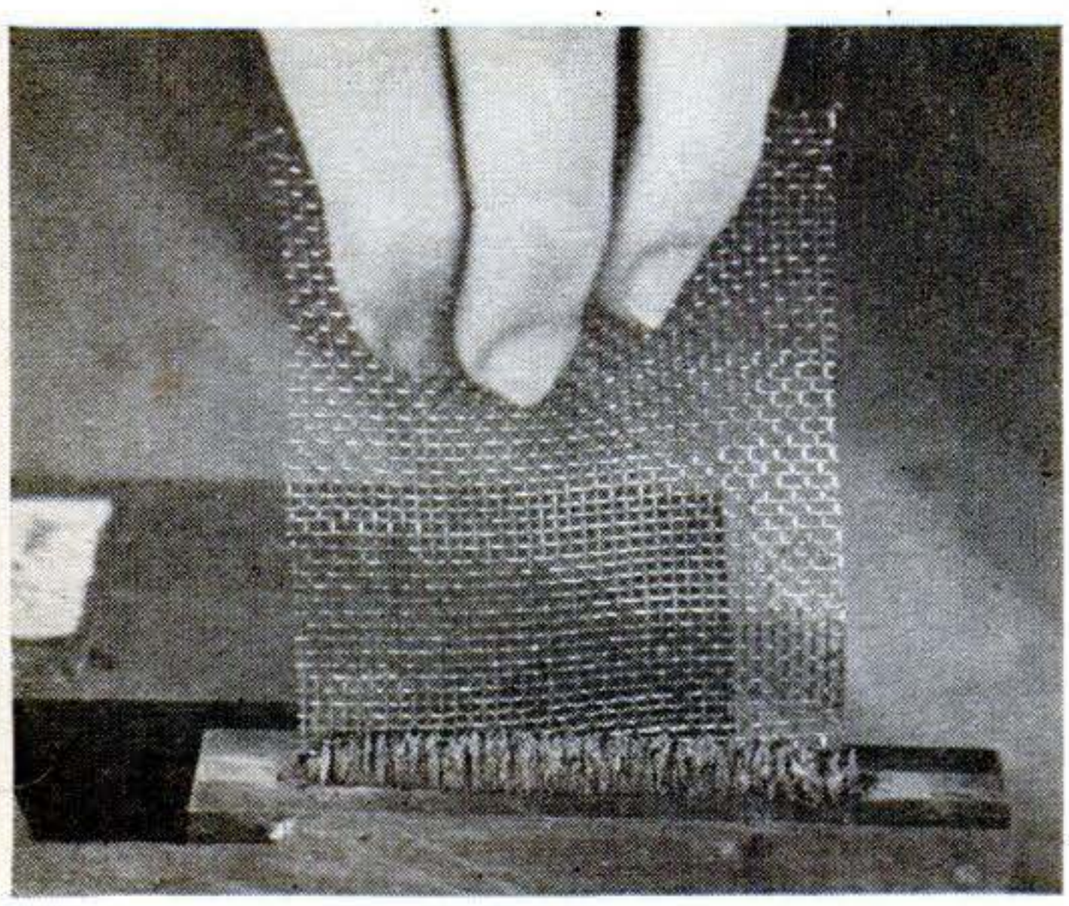


Dry friction clutch uses plates of unlike materials pressing against each other. It wears rapidly, overheats, and lacks uniformity. Fluid coupling combines centrifugal pump with turbine for smooth action, but cannot be locked, hence wastes power. Dry electromagnetic type is fast, easy to control, but tends to overheat and isn't smooth. Winslow electrostatic clutch (far right) is good for fast control but needs high voltages and close spacing of its plates.

it required high voltages and close spacing —factors Rabinow wanted to avoid.

"What would happen," thought Rabinow, "if I substituted electromagnetism for electrostatic attraction and iron particles for the starch?" He stirred up a "gunk"—his own term—of oil and iron powder. Into it he dropped a small electric motor, with a steel cylinder substituted for the rotor. When he turned on the juice, the gunk gummed up and froze the cylinder so solidly between the poles of the motor that he couldn't turn it with his fingers.

Rabinow hadn't expected quite so much. He was afraid the iron particles had got into the bearings and jammed the motor. But further tests proved his original hypothesis. The gunk became solid when magnetized, and the degree of solidification could be controlled precisely and quickly (1/30th of a second or faster) by regulating the strength of the magnetic field. The magnetic fluid clutch was the next step to come.



Screening, dipped into magnetized iron-oil mixture, shows how metallic particles align themselves into "chains" that bind the clutch plates as tightly as would steel clamps.

In its simplest form the new clutch consists of a driving shaft with a magnetic plate at its end, and a driven shaft also tipped with a magnetic plate. The iron-oil gunk fills the space between the plates. It is the only connection between the driving and driven elements.

A magnetic field established between the two plates snaps the iron particles together into "chains" that lock the plates. When the mixture is demagnetized, it returns to its original fluid state and the driving plate turns freely. Since an electric current produces the magnetic field, the binding power of the mix can easily be regulated by increasing or decreasing the current.

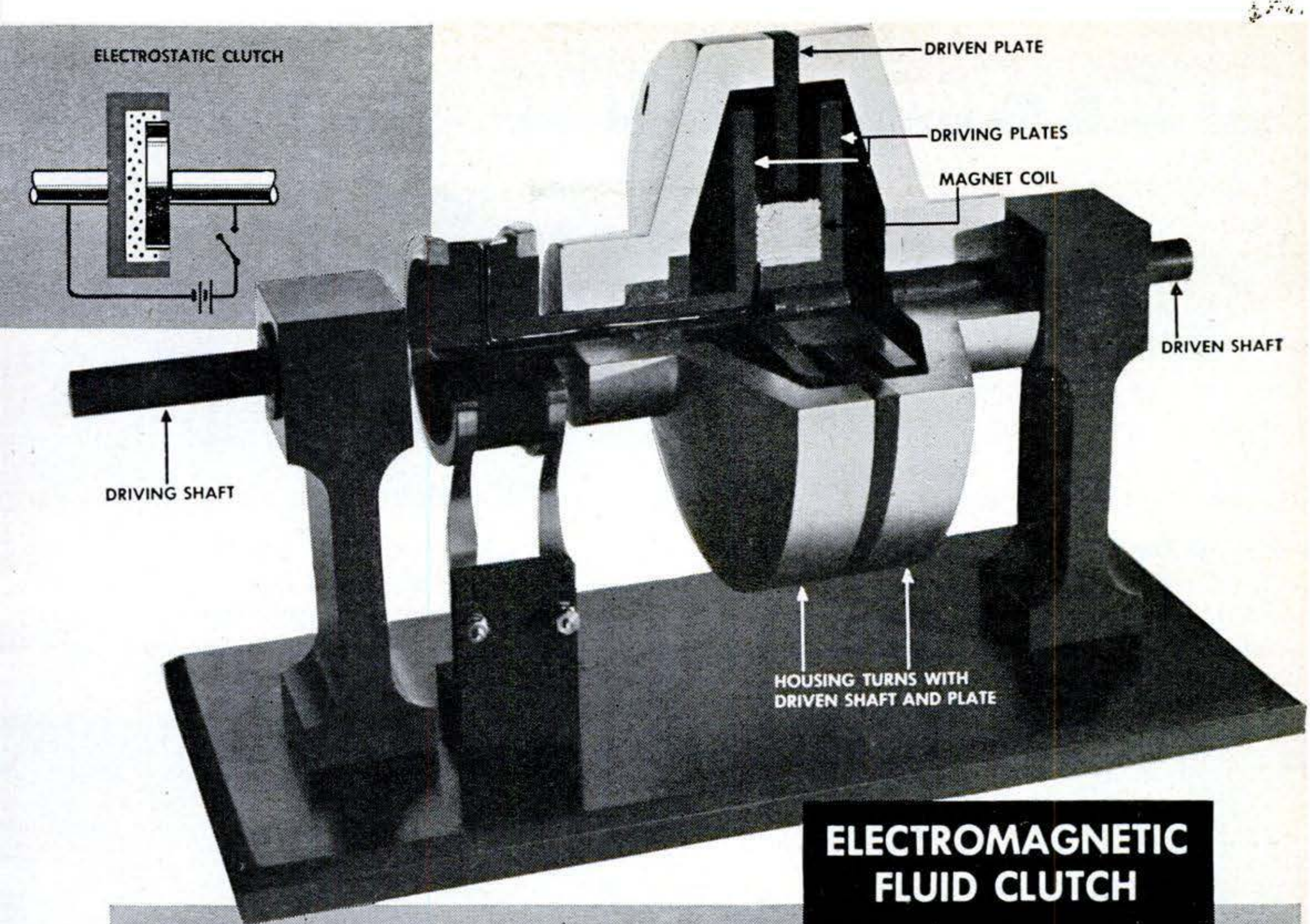
Many Advantages

Preliminary tests indicate many advantages over other clutches. Since all surfaces are bathed in oil, action is smooth and wear almost nonexistent. Any abrasion merely adds to the supply of iron particles and may actually increase efficiency. The clutch is easy to control and requires only a small amount of electric power. The type of oil used is unimportant, so silicone liquids may be used for good performance at very low and very high temperatures.

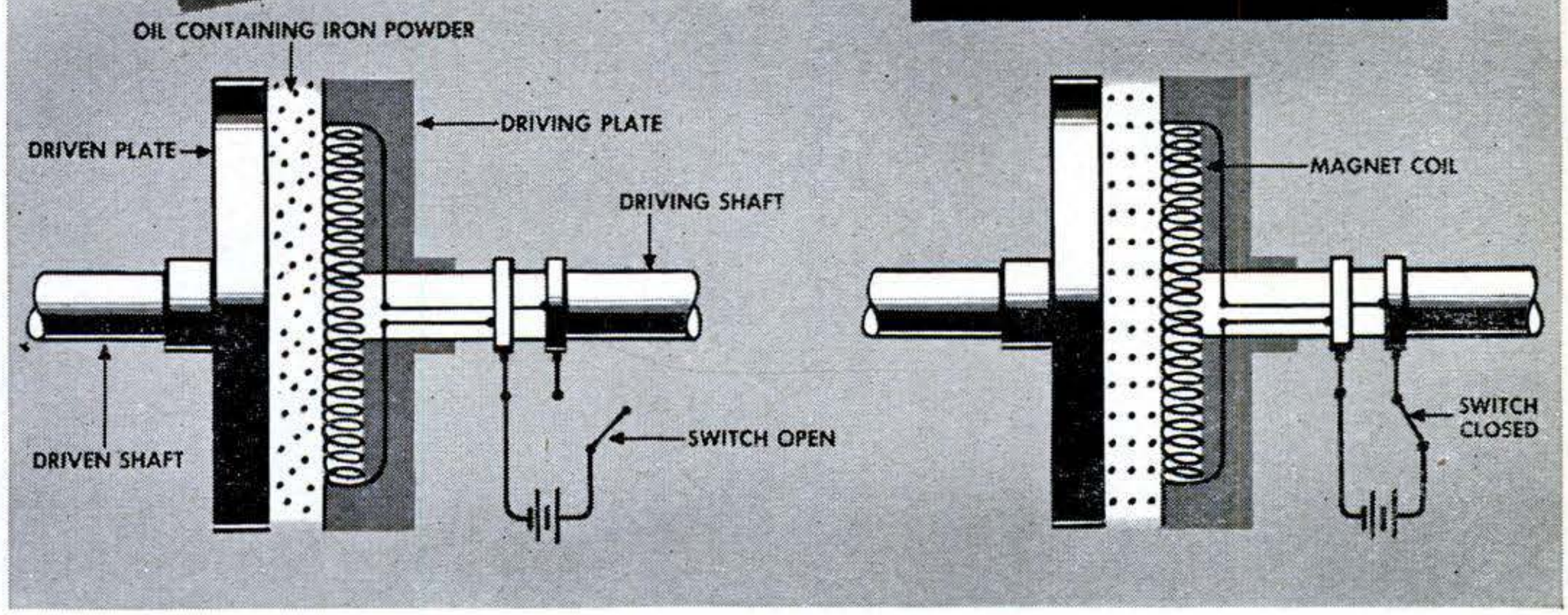
Most obvious application of the clutch, of course, would be in autos, although such a model has not yet been tested. Its characteristics of easy control and low voltages are made to order for automatic transmission systems, where permanently engaged gear trains are clutched in and out according to speed, throttle setting, power load, and so on. Its long life and simple construction also recommend it for autos.

But Rabinow and his associates believe the biggest field for the new clutch is in

Copyrighted material



ELECTROMAGNETIC FLUID CLUTCH



Cutaway model of a simple magnetic fluid clutch. Varying the strength of the magnetic field controls the "stickiness" of the iron-oil mixture that fills the clutch casing. Any degree of torque from complete disengagement to complete locking can be transmitted from driving shaft to driven shaft smoothly and almost instantaneously. Diagrams show how it works.

servo mechanisms—those little electric motors that translate electronic information into reactions of purely mechanical instruments —that do the pushing for the push-buttons.

Even now, servos are steering large trucks, tanks, and aircraft. They operate power brakes in trucks and in some custom autos. They control printing presses and radar antennas, sight and fire big guns, and run electronic calculators.

Servos can be operated with variable speed motors, hydraulic transmissions, and other means, but clutch-and-brake systems work the best. Since servos must operate smoothly over a wide range of speeds, they must be easily and almost instantaneously controlled and must resist wear. Here is where the magnetic fluid clutch, which fulfills all these conditions, will probably find its greatest use. END

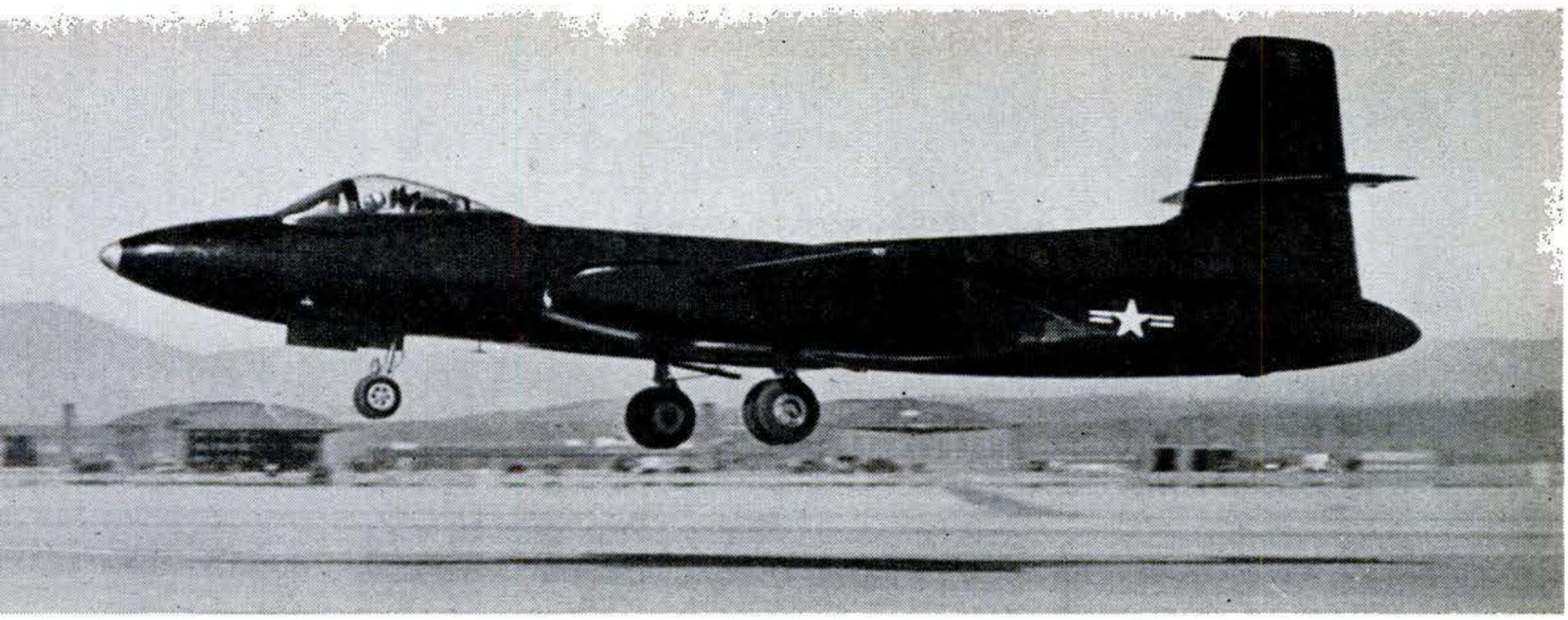
Copyrighted material

What's New in Aviation

'Copter Designed for Sea Duty. All-metal rotor blades are featured on this new XHJS-1 Sikorsky helicopter. It is intended for utility, rescue, and observation work aboard aircraft carriers, battleships, and cruisers, so the tail rotor is raised above head level for safety in shipboard landings. A floor hatch permits aerial photography.

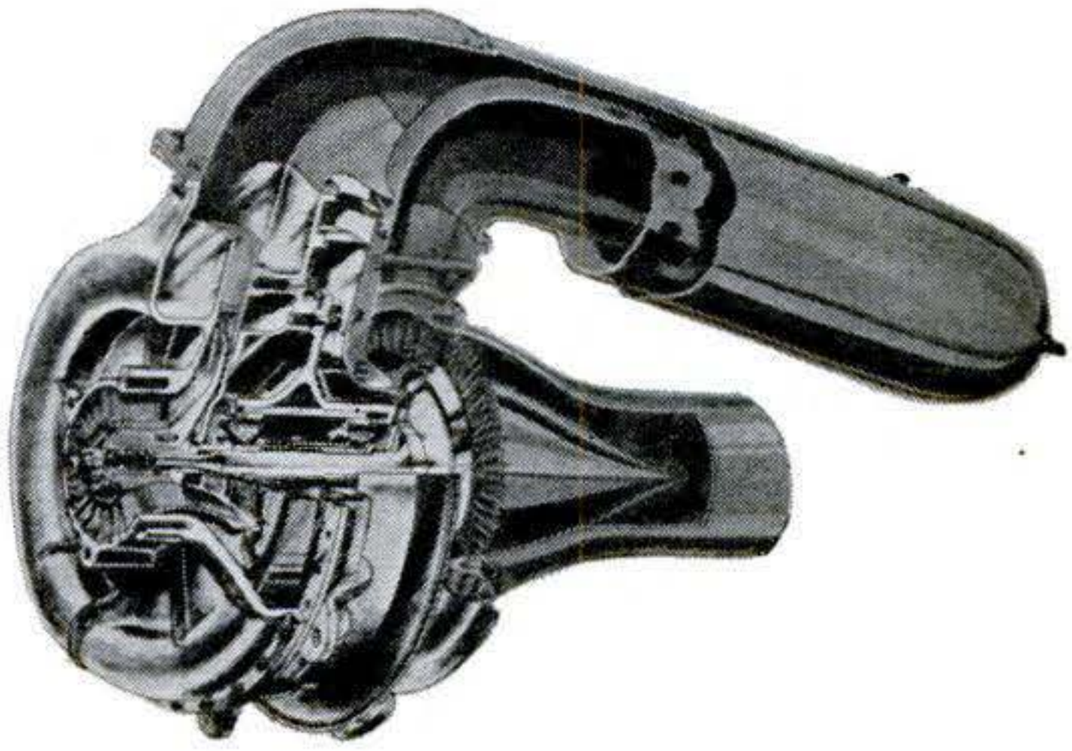
Shooting Star Doubles Up. To speed up training of USAF jet pilots, Lockheed has developed this two-seat version of the P-80. Called the TF-80C, it is powered by a new Allison engine, and is identical with the Shooting Star except that it is 38 inches longer and has a seven-foot, hydraulically operated canopy enclosing both pilots.

Copyrighted material

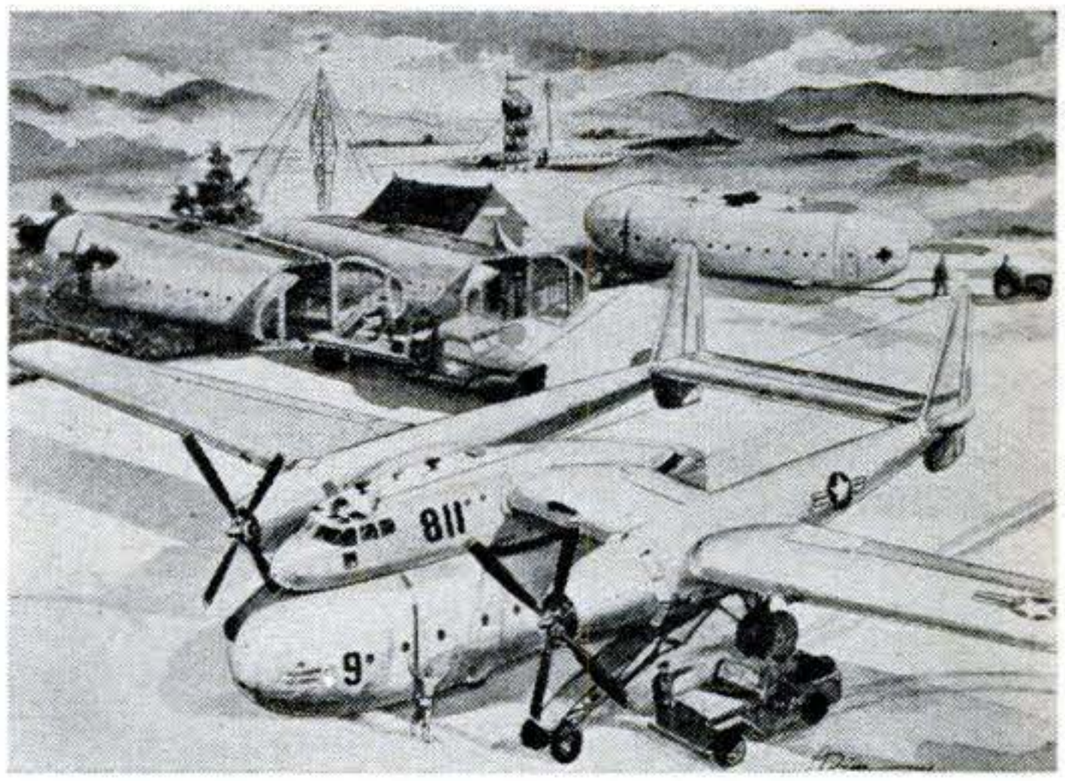


Four-Jet Take-Off. Almost as big as a B-17 Flying Fortress bomber, this huge Curtiss-Wright XP-87 jet fighter recently made its first successful test flights for the U. S. Air Force. Built for operation under all kinds of weather conditions, the plane is powered by four Westinghouse 24C jet engines. It carries a crew of two.

Target Planes Get Jet. War-surplus turbosuperchargers, with a combustion chamber added (right), make cheap, expendable jet engines that provide high-speed propulsion for the Navy's target drones. The tiny power plant, weighing only 181 lb., is made by West Engineering, of Los Angeles.



Jet Escorts Jet. With a speed of more than 650 m.p.h., the sweptback P-86 jet fighter, in foreground, makes an ideal medium-range escort for its big-bomber brother, the four-jet B-45, in background. It can accompany the 480-m.p.h. bomber 500 miles from its base. Both are North American planes, with TG-180 turbojet engines.



Sky Trailers Are Coming. A detachable-fuselage plane, to be known as the C-120, is being developed by Fairchild for the Air Force. Artist's conception shows how the cargo compartment, with a nine-ton capacity, would fasten to the carrier plane. It may prove possible to drop the pack in flight, or skid it off at low altitude.

Copyrighted material

Mail-toting rocket is a stainless-steel tube 11 feet 3 inches long. Unloaded, it weighs only 60 pounds. Cost: $50. Letters are carried inside four tail fins that stabilize it in flight.

Launching tower, below, is 14 feet tall. The rocket slides along an aluminum T-stock on three ball-bearing clips. Operator in foreground is connecting ignition wires to fuse.

Rockets Carry The Mail

WATER barriers and impassable terrain may be no more able to halt the mails than the traditional snow, rain, heat, or gloom of night, if these experiments work out. Rocket postmen can hurdle obstacles in a few seconds, as shown in these pictures. Here the fiery missiles are carrying letters a mile and a half across Searles Dry Lake in southern California.

The demonstrators are amateur rocketeers of the Glendale, Calif., Reaction Research Society, whose 90 members are mostly high-school and college students. Their work carries forward experiments broken off in Austria, Germany, and England when rockets were drafted for war.

The equipment seen in action here could speed the delivery of letters to off-shore islands surrounded by heavy surf or to villages in mountainous territory where a mile or two might be a day's walk. It could also be adapted for use on mail steamers that must travel for hours along a coast before making port.

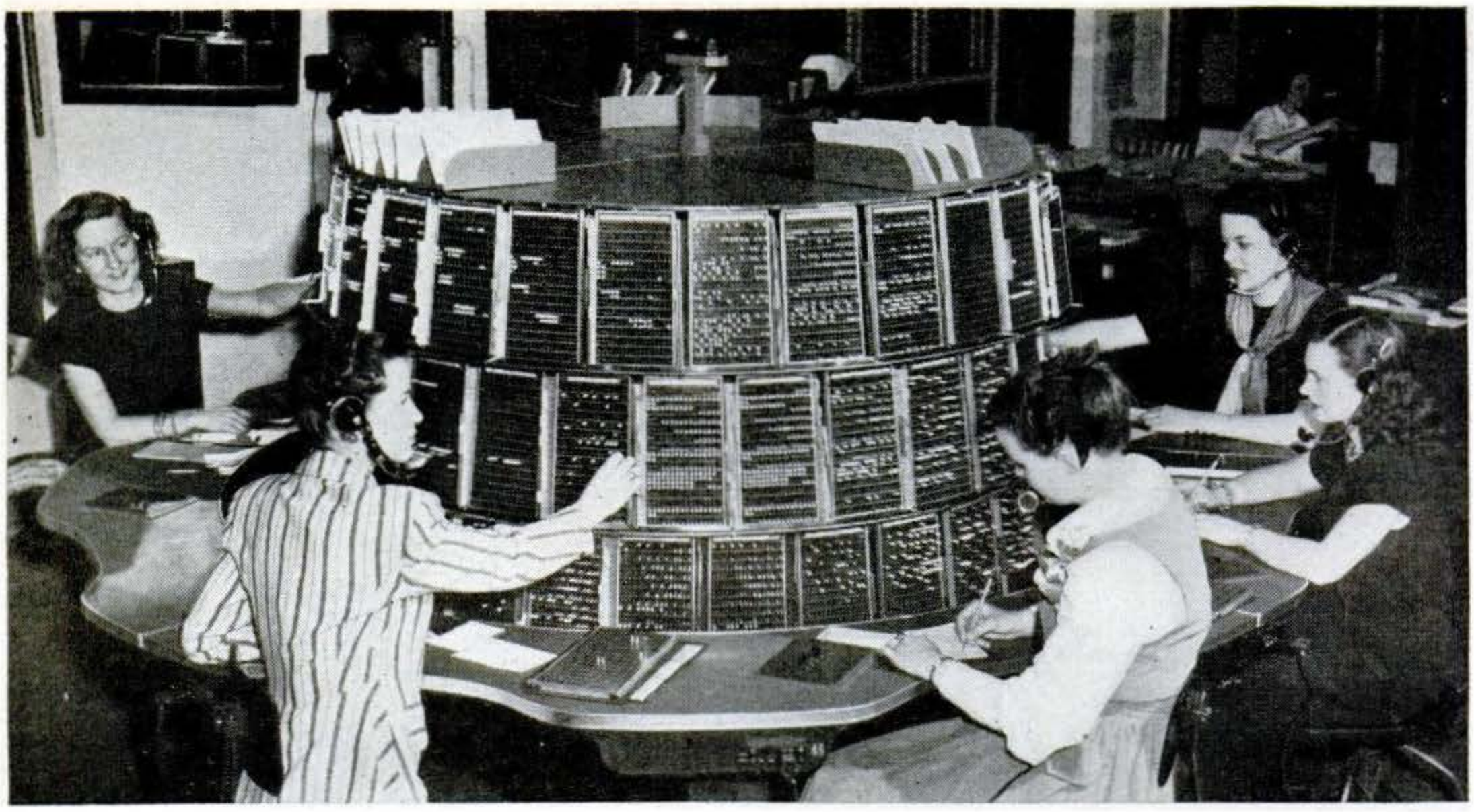
In foxhole a safe 250 feet from the launcher, rocketeer below closes contact to fuse squid, now packed in rocket's tail behind propelling fuel. Car battery supplies the firing charge.

Rocket is driven by 35 pounds of micrograin powder, mostly zinc dust and sulphur, which burns out in four seconds. It climbs to 4,000 feet and reaches speed of more than 400 m.p.h.

At its destination spent rocket is dug from salty earth in which it buried itself on landing. Tail is then removed for easier handling, and a brace is used to take covers off fins.

Opened fin shows compartments where letters are carried. Each of the four sections of the rocket's tail has room for 300. Fins are made of aluminum sheets on frame of ½-inch plywood.

Copyrighted material

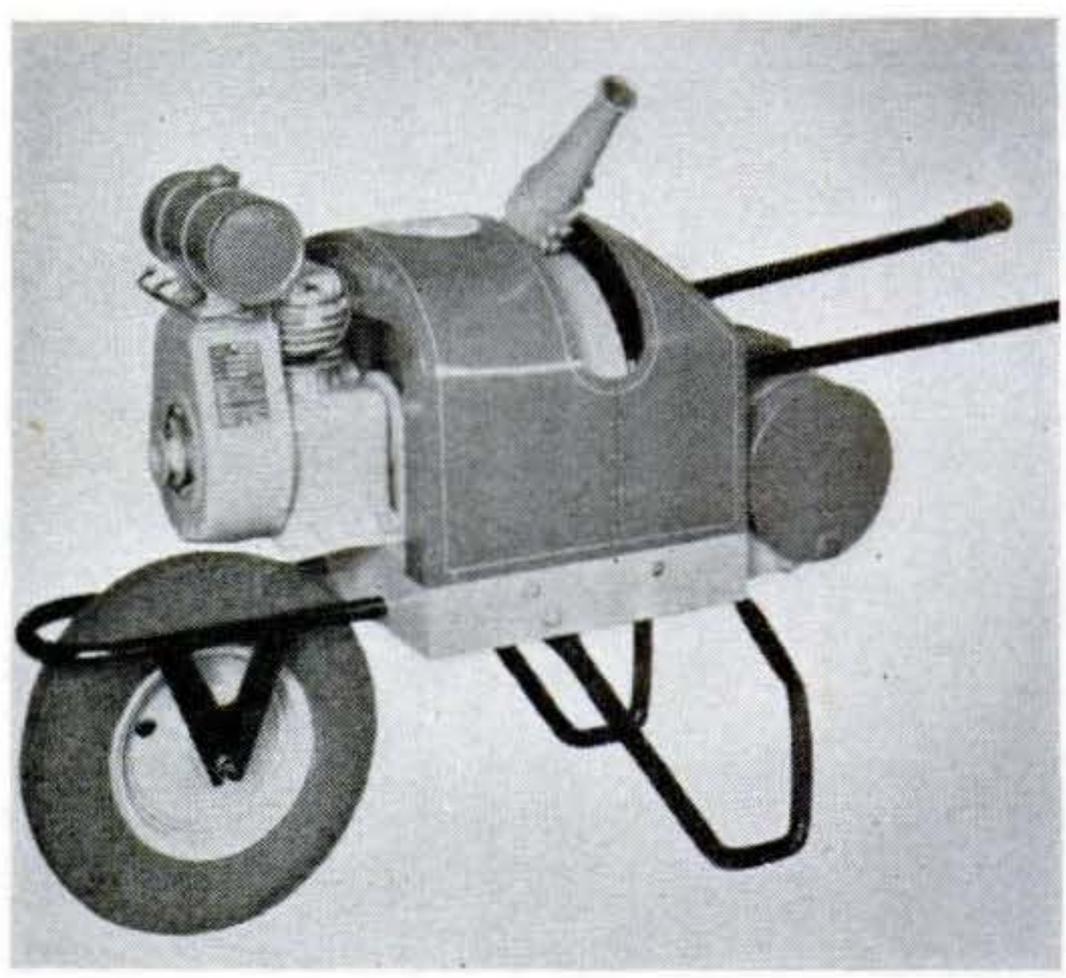


Train Space at a Glance

YOU'LL get your train reservation in a hurry if this rotary recorder proves as good as the New York Central anticipates. Each of 84 panels on three revolving drums represents a single train for a particular day. Different colored pegs indicate the types of space still open for reservation. Now in operation at the railroad's Grand Central Terminal in New York City, the system, if successful, will be extended to other cities.

Lamps Signal Danger

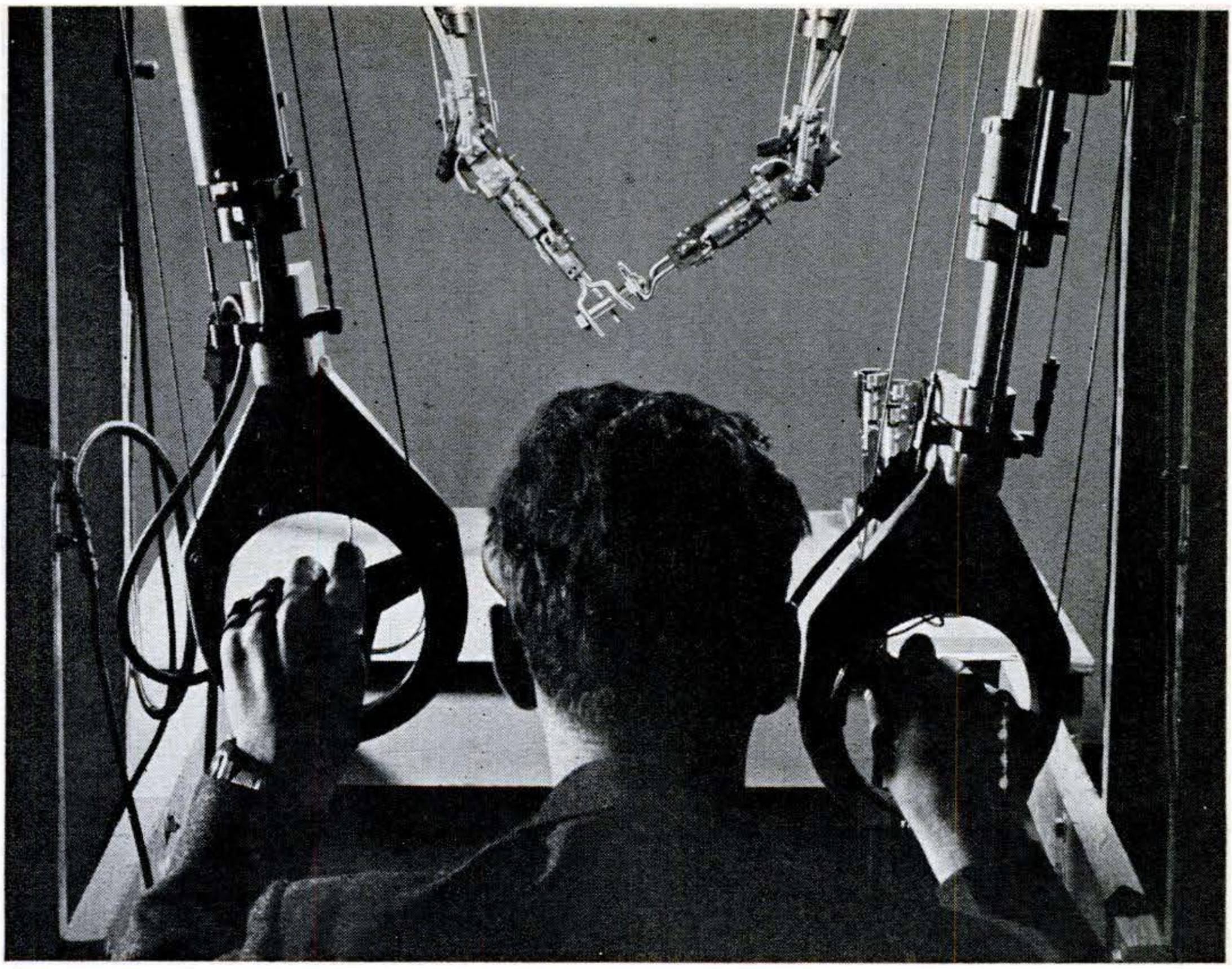
THESE new, portable marker lights blink 120 times a minute to call attention to danger spots, road obstructions, or other temporary hazards. The big, cone-shaped one at right, designed for airport use, weighs 34 lb., the smaller one at left 22 lb. Westinghouse products, both are battery operated, with a life of 150 hours. A red neon lamp is used as a danger signal. For other needs, two-watt white, gold, green, or blue fluorescent-type lamps are available.



Mist Kills Pests

THIS Whirlwind Ⓣ wheelbarrow-type mist blower is a new weapon against shade-tree insects, weeds, mosquitos, and other common pests. All controls are built into the handles so that the operator can direct the spray as he moves along. Designed for small acreages by the Fitzhenry-Guptill Co., of Cambridge, Mass., the machine can send a mist-laden air stream 30 to 40 feet up in still air, or can drift the mist more than 500 feet with the wind.

Copyrighted material



Operator yards away guides mechanical hands, without usual mirrors, in putting nut on bolt.

Seven-League Hands For Hot Atoms

PS Photos by Hubert Luckett

REMEMBER the sailor in the picture "The Best Years of Our Lives"—the boy who had lost his own arms but could do almost anything you can do with his "hooks"? That sailor's hooks are now a vital tool in atomic research. As the "hands" at the ends of long steel arms in General Electric's new remote manipulator, they reach over a high, thick wall to hold deadly radioactive "hot stuff"—picking it up, performing experiments with it, and operating tools on it —all at the command of a human operator sitting yards away safely behind the wall.

It all began last year when John Payne, GE research associate, toured the plutonium works at Hanford, Wash. He was impressed by the remotely controlled devices that handled intensely radioactive materials from behind shields. But he felt something was missing: there were many special-purpose devices, but no versatile gadget that could do all the jobs a man does with his hands. That night Payne went to a movie—you guessed it, "The Best Years of Our Lives." Back in Schenectady he started figuring. The result is a gigantic yet simply operated machine that *can* do the things human hands do. It runs machine tools, pours chemicals, fastens screws and bolts, even peels bananas. In every atomic laboratory from Berkeley to Brookhaven it is known as The Machine that Can Undress a Babe without Pinching.

Sketch Shows Hands in Use

For artist's conception of remote manipulator setting up dangerously radioactive material in lathe inside hot laboratory, turn to next page.

Copyrighted material

SHIELD

TUBE MOVES FOR PUSH-PULL AND SWING MOTIONS

ENDLESS BELT TRANSMITS ARM-TURN

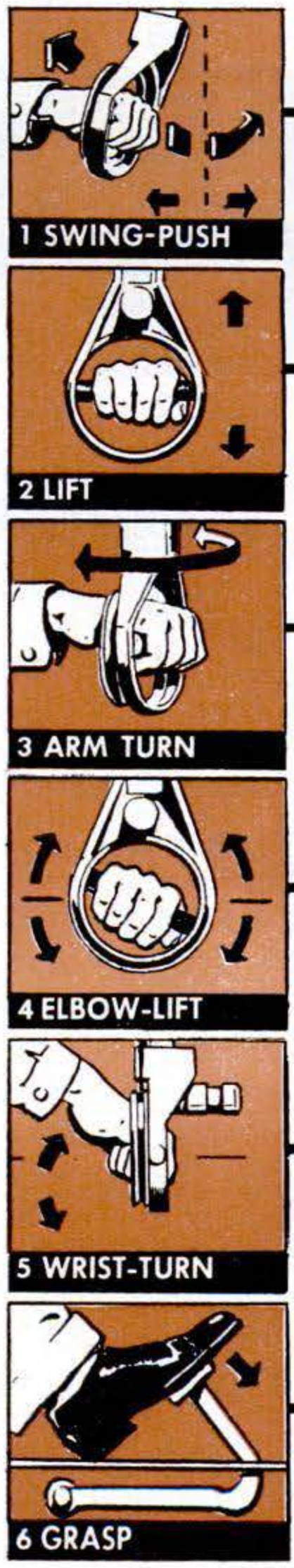
MIRROR

WHEN ROD IS RAISED, CABLE NETWORK LIFTS "HANDS"

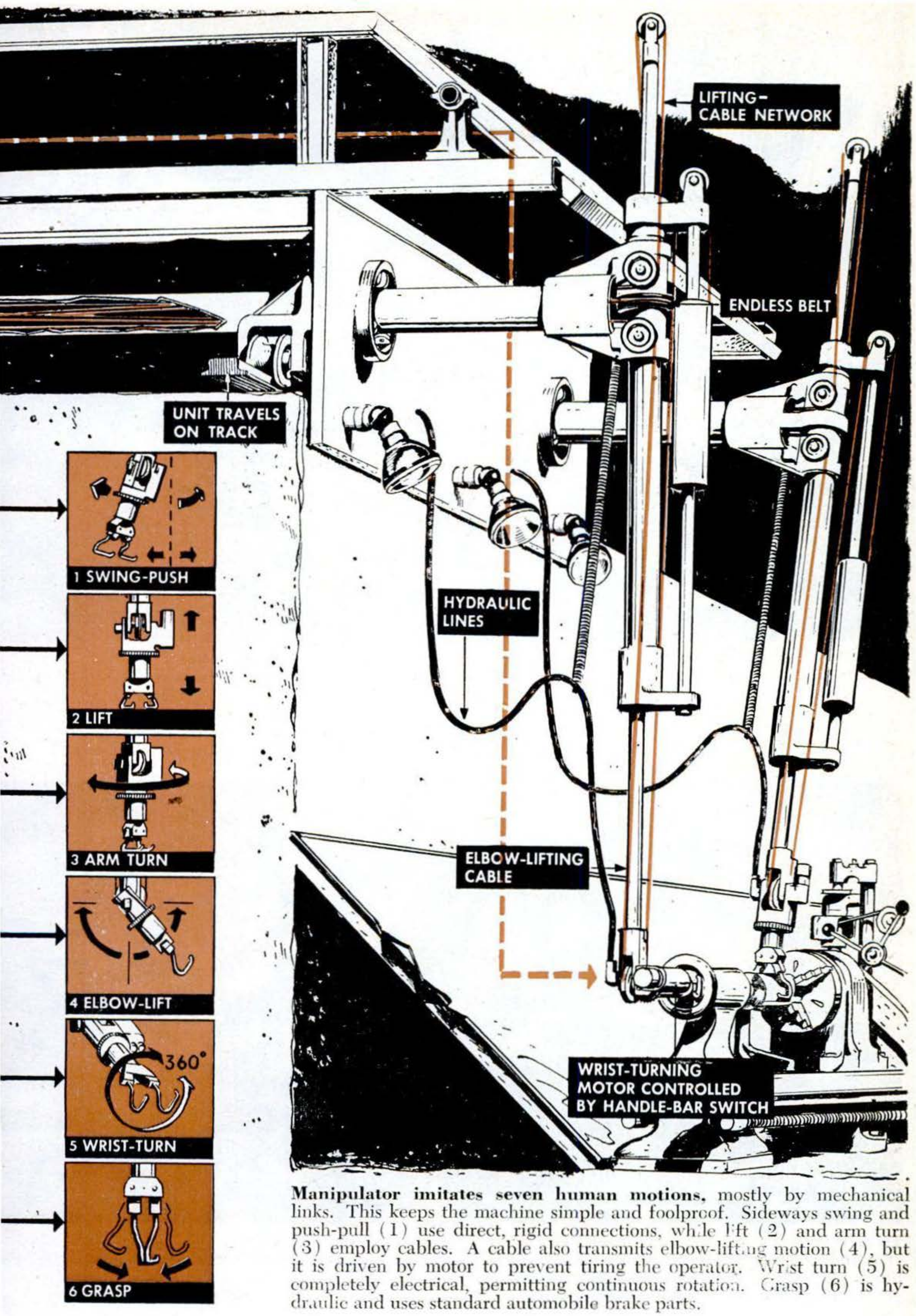
HANDLE-BAR SWITCH CONTROLS MOTOR TO DRIVE ELBOW-LIFTING CABLE

HANDLE-BAR SWITCH FOR WRIST TURN

PEDAL-OPERATED HYDRAULIC SYSTEM CONTROLS GRASP



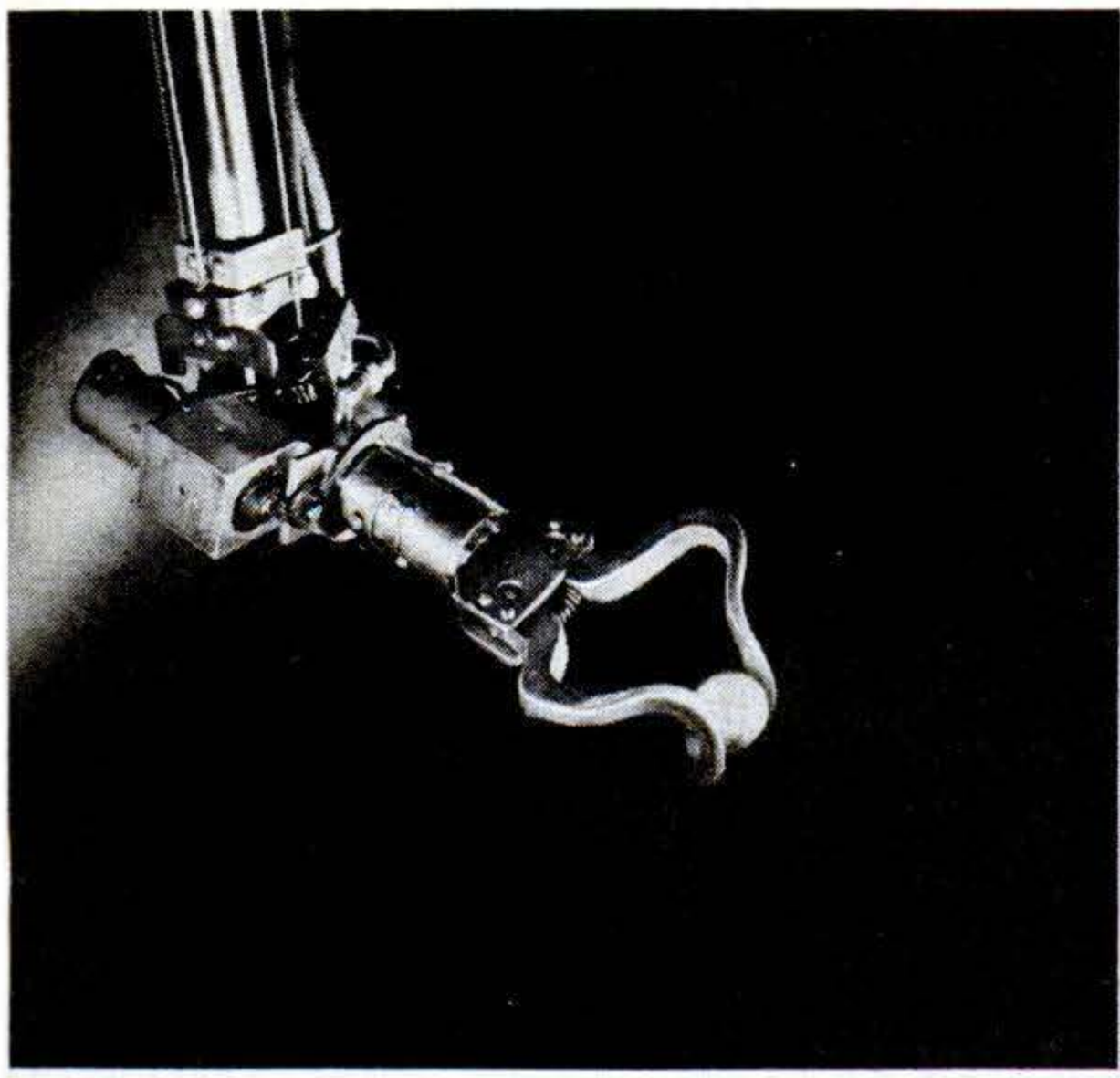
Copyrighted material

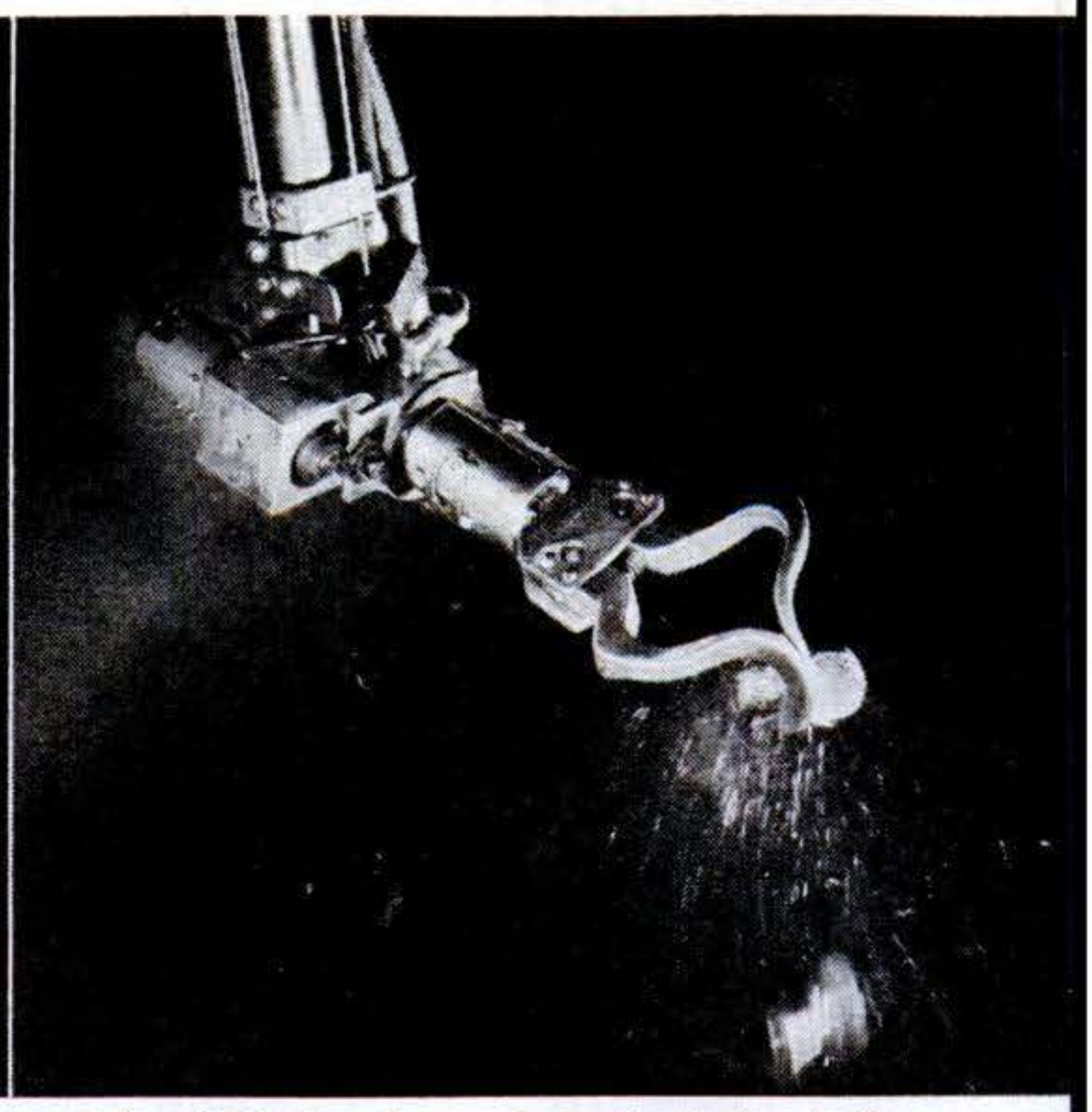


Manipulator imitates seven human motions, mostly by mechanical links. This keeps the machine simple and foolproof. Sideways swing and push-pull (1) use direct, rigid connections, while lift (2) and arm turn (3) employ cables. A cable also transmits elbow-lifting motion (4), but it is driven by motor to prevent tiring the operator. Wrist turn (5) is completely electrical, permitting continuous rotation. Grasp (6) is hydraulic and uses standard automobile brake parts.

Copyrighted material

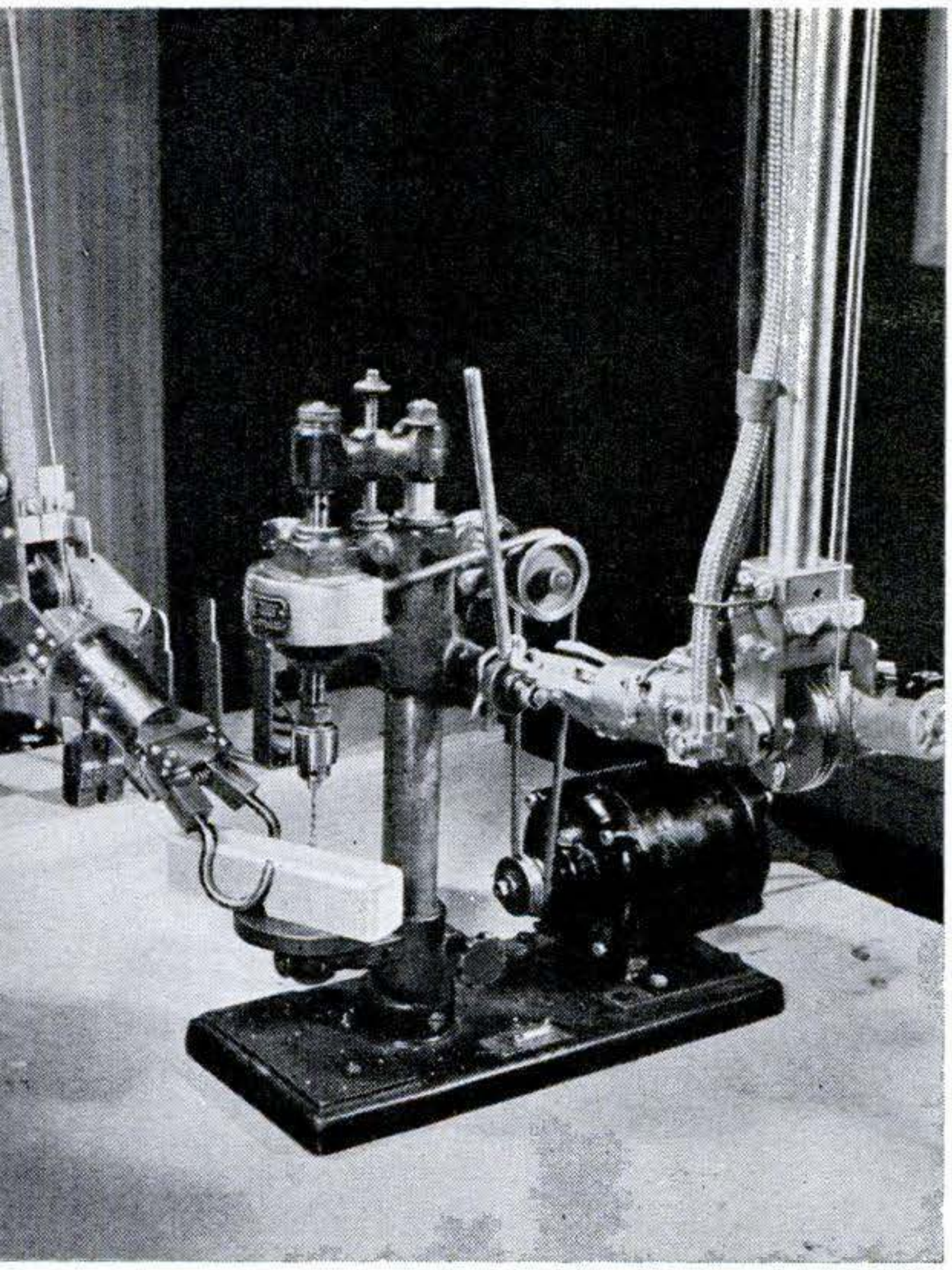
Typical of the work expected of the manipulator is this operation with chemicals. After the correct amount of liquid has been poured into the beaker, the hands can pour from beaker into a filter, remove any precipitate left on the filter, weigh it—and throw it into a trash can. Until now, only specialized equipment for performing some of these operations was available. Such handling of radioisotopes—some so "hot" that holding a hand over the beaker for a few seconds would cause injury or death—is increasing in research with nuclear-fission products.





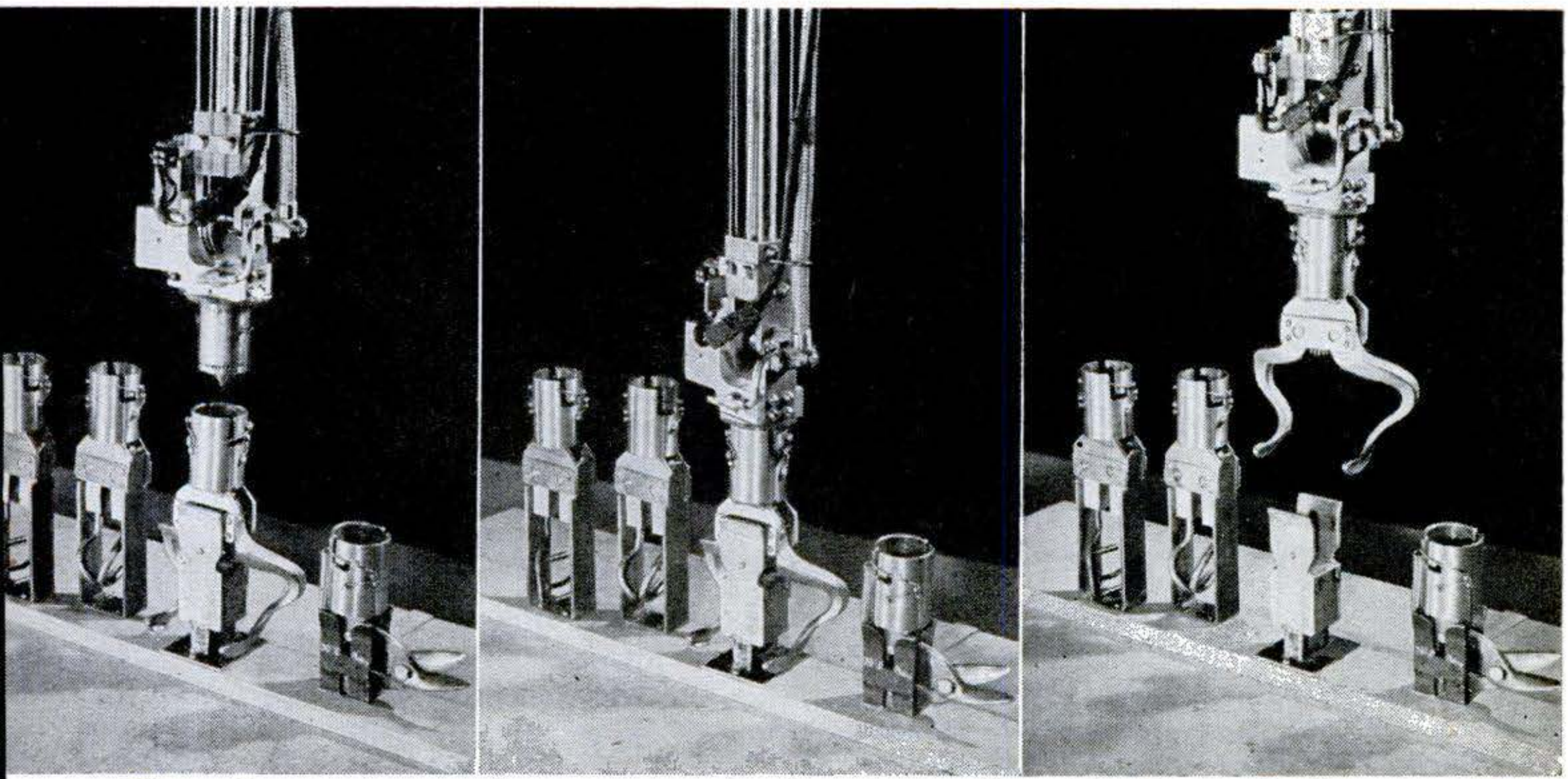
To demonstrate the operator's precise control over the machine, inventor John Payne made the hands pick up photographer's flash bulb so gently it didn't crack (left). He then pressed foot pedal a little harder and crushed the bulb (right). Foot operation of grasp was chosen because operators can judge foot pressure from experience with car brake and accelerator pedals.

Copyrighted material



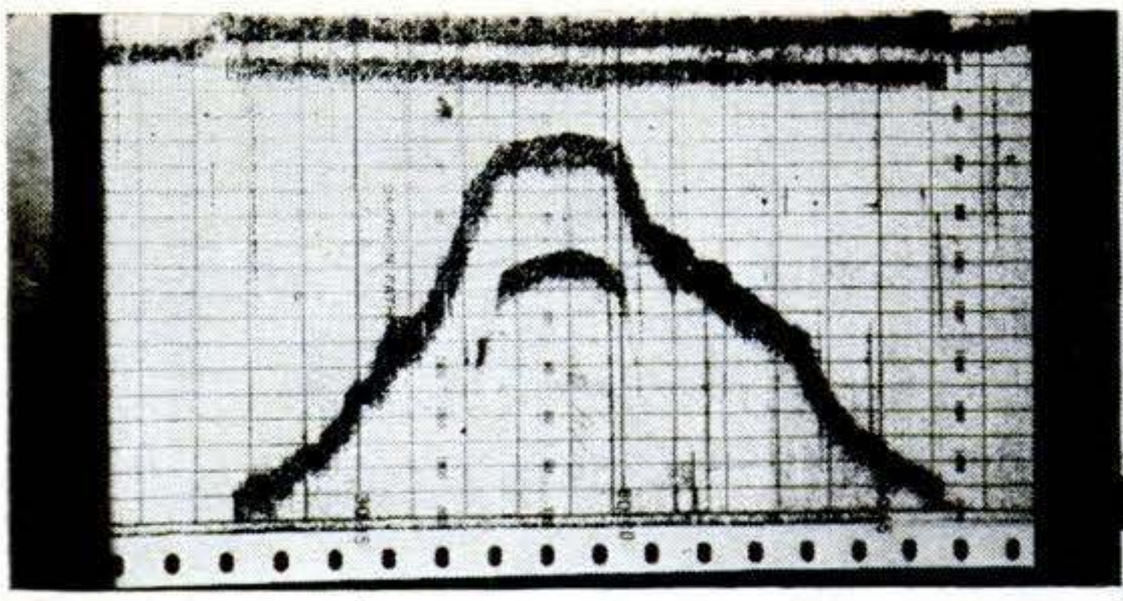
Mechanical hands can operate tools easily to drill, machine, or mill radioactive material in the form of metal bars or other solids. In fact, they can do this even better than human hands; for the mechanical wrists, unlike man's, can turn completely around and around.

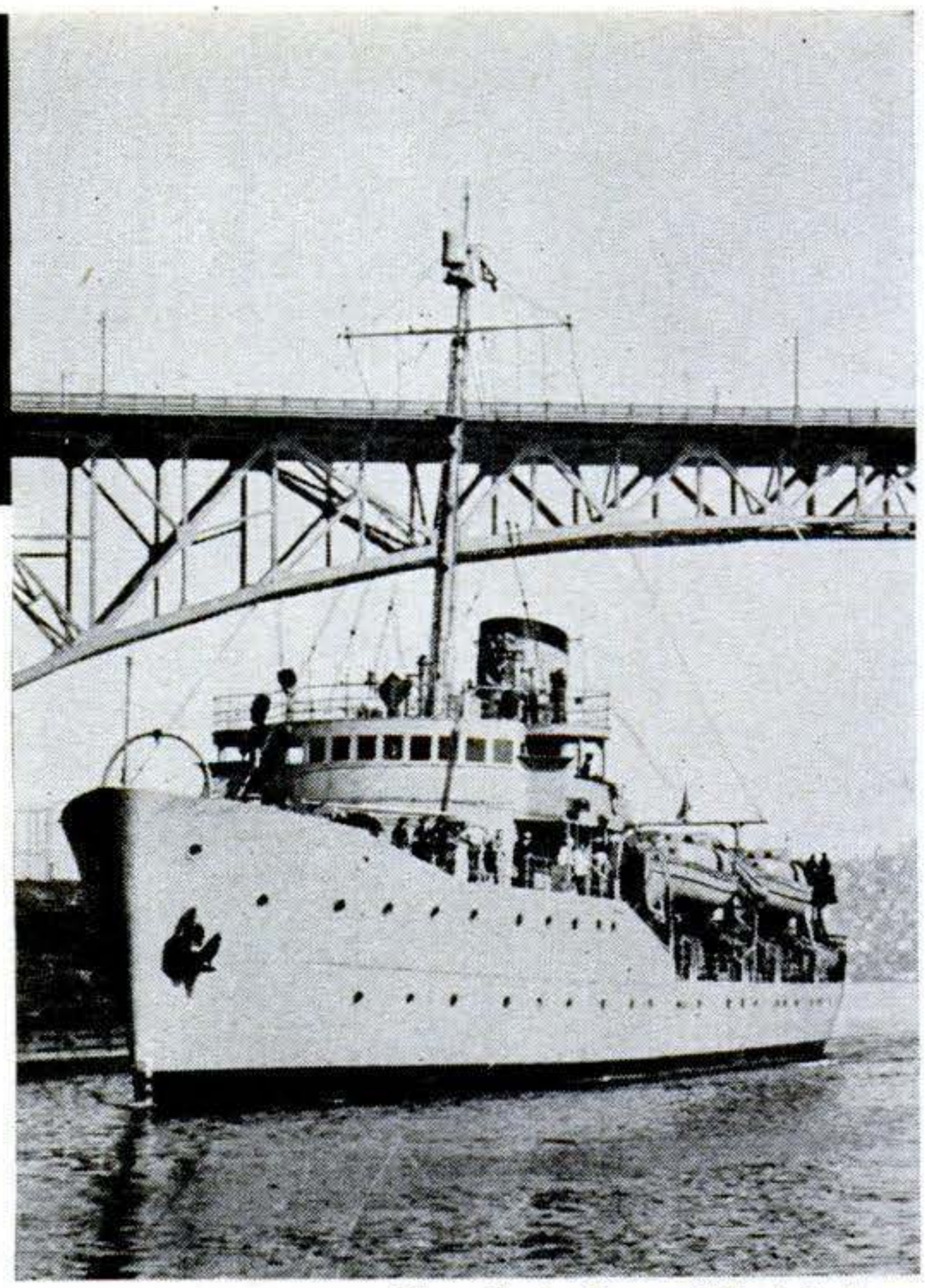
GE engineer Charles Hoffman, who assisted Payne in designing the manipulator, shows how the operator works the controls. Since mirror system makes the hands seem even farther off than they really are, binoculars are used for making fine adjustments and reading scales.



Manipulator can even change its own hands, selecting them from a rack that holds several types for special jobs (note that one at right is **tin snip**). Left photo shows spindle positioned over socket of hand. Spindle then moves down and twists to lock hand in place (center) and finally pulls new hand from rack (right). Hands will pick up dust, become "hot" themselves.

Copyrighted material





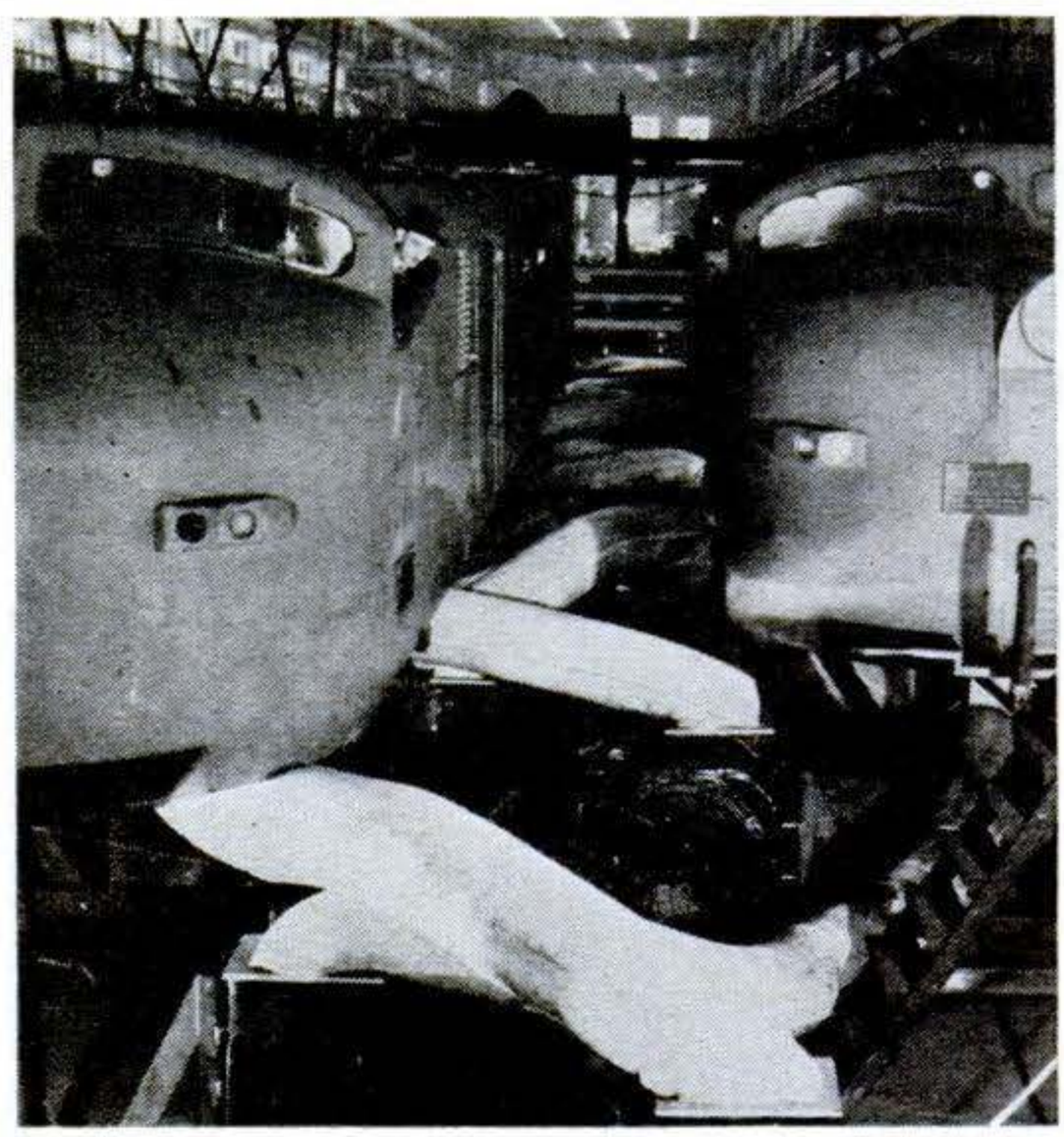
Secret Sea Peak Found

A GIANT submarine mountain more than two miles high has been found only 800 miles off Seattle. This latest discovery of sea-snooping scientists is the highest peak known in the entire North Pacific Ocean, towering up 11,500 feet to within 2,760 feet of the surface. The discovery was made by the *Pathfinder* (right), Coast and Geodetic Survey ship. Radar located the mountain and recorded its profile, shown above. The half moon just below the peak is a double echo. Sounding surveys help locate new fishing grounds and aid ships using submarine peaks as navigation guides.

Photos by the Coast and Geodetic Survey

"Boots" Protect Bridges

"BOOTS" of ¼-inch wrought iron filled with concrete are now protecting two Massachusetts bridges against the erosive action of salt water, ice, and tides. Top photo above shows how the concrete piles on one, the Bass River Bridge, near South Yarmouth, had been badly worn; below is the same bridge after installation of the "boots."

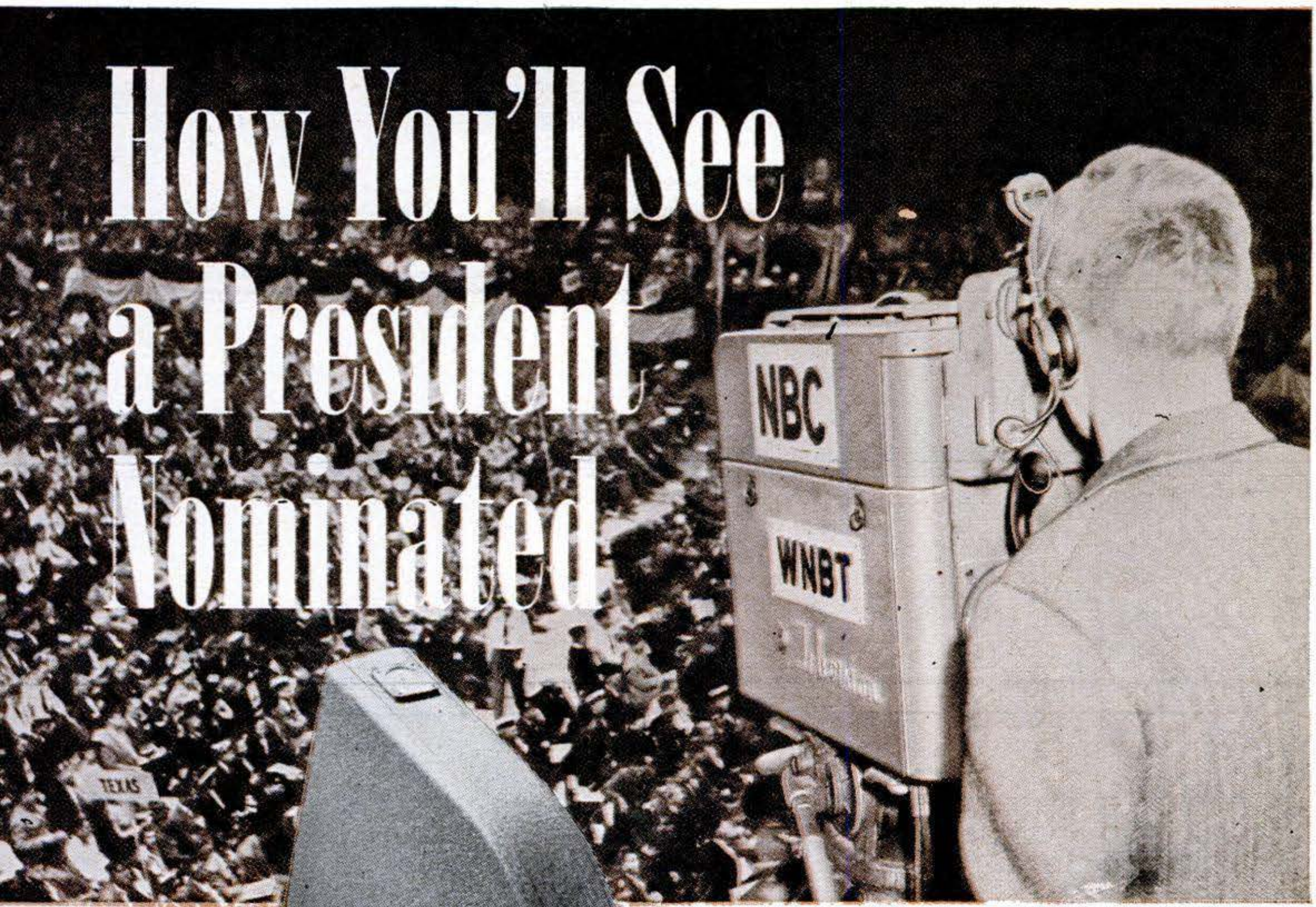


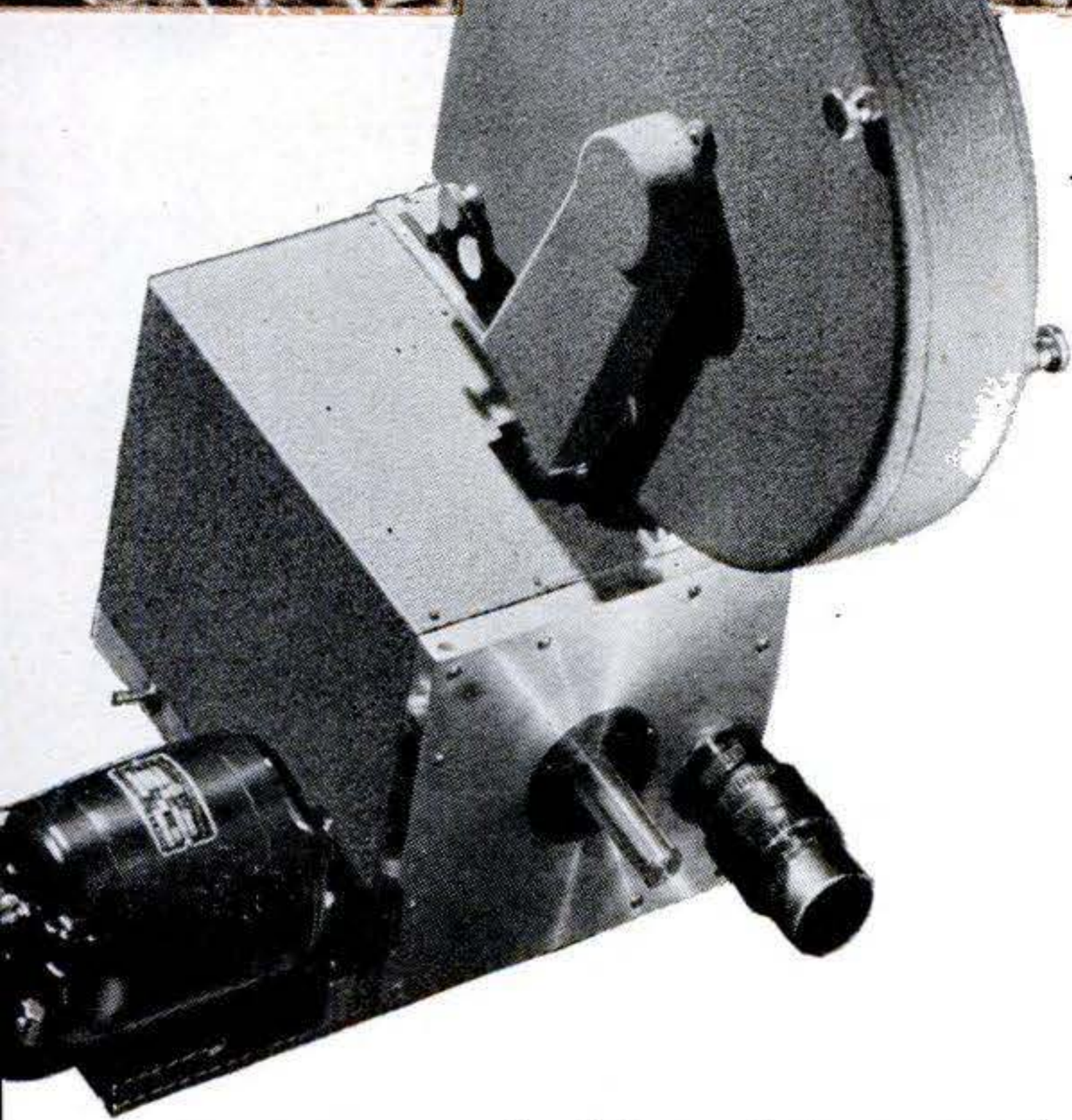
Locos Grow "Legs"

LOOKING as if they are about to get up and walk away, these Westinghouse electric locomotives are undergoing tests before final assembly at Pittsburgh, Pa. The crab-like "legs" are canvas tubes used to ventilate their electric motors, between the cabs awaiting installation. Six motors, totaling 4,000 hp., are used in each locomotive.

Copyrighted material

How You'll See a President Nominated





Television cameras like one above will show 1948 political conventions to audience of 3,000,000. Movie cameras, including new Kodak (left) that photographs screen image, will also be used.

MANY people did not believe in telegraphy until it was used at the Democratic National Convention in 1844. Radio was not fully appreciated until after the same party's convention in 1924. This year television is expected to show its value to 3,000,000 people by enabling them to see both the Republicans and Democrats nominate presidential candidates.

Every video station in the East will be tied to the Philadelphia convention hall. And movies will be rushed to stations beyond the present networks' reach. More than 15 television cameras, as many movie cameras, dozens of high-powered spotlights, nearly 100 microphones, and miles of wire have been assembled to do the job.

Inside the big auditorium, four television cameras will be operated cooperatively for all stations by the three tele networks. As shown on next page, two cameras will be in a balcony box, another opposite. They will give you a better look at the speakers than any delegate gets, and can be swung to cover the floor. The fourth camera, in a corner of the stage, will cover the rostrum. Beside each tele unit will be a movie camera. Films will be edited into short summaries and televised at the end of each day.

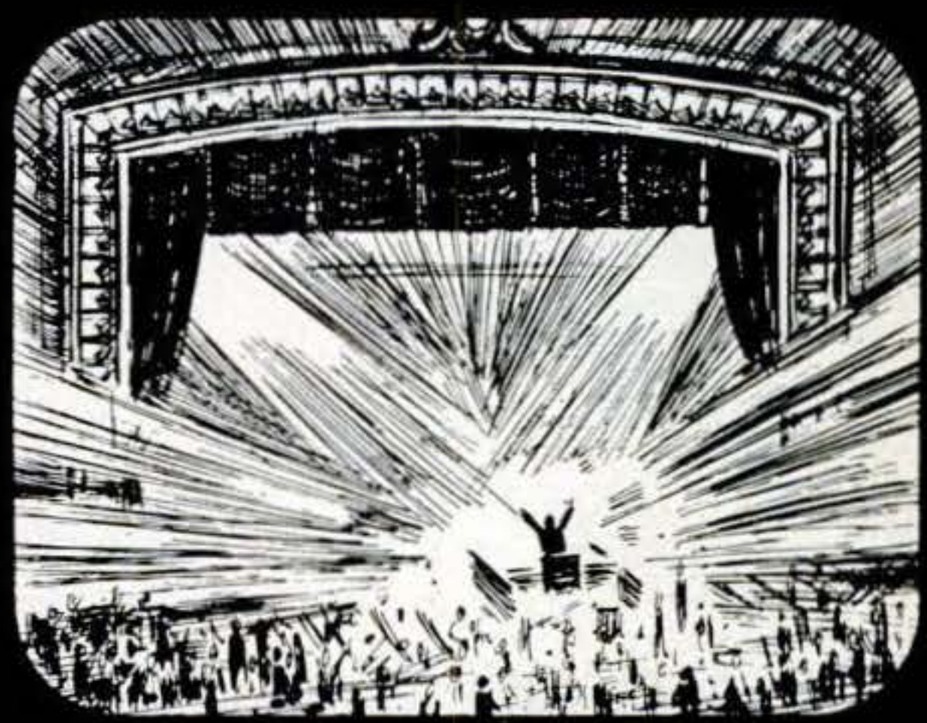
Powerful lights will flood the auditorium for both television and newsreels. Ten 10,000-watt "floor broads" will be installed in the balconies, and ten 5,000-watt "high broads" will hang from the ceiling.

Copyrighted material

Artist's conception of convention scene at the Philadelphia auditorium shows how cameras located inside and outside will get varied shots of activities. Director, sitting before battery of viewing screens in booth at right side of stage, can select picture from any one of five cameras for transmission to television stations, either over coaxial cable or by microwave relay.

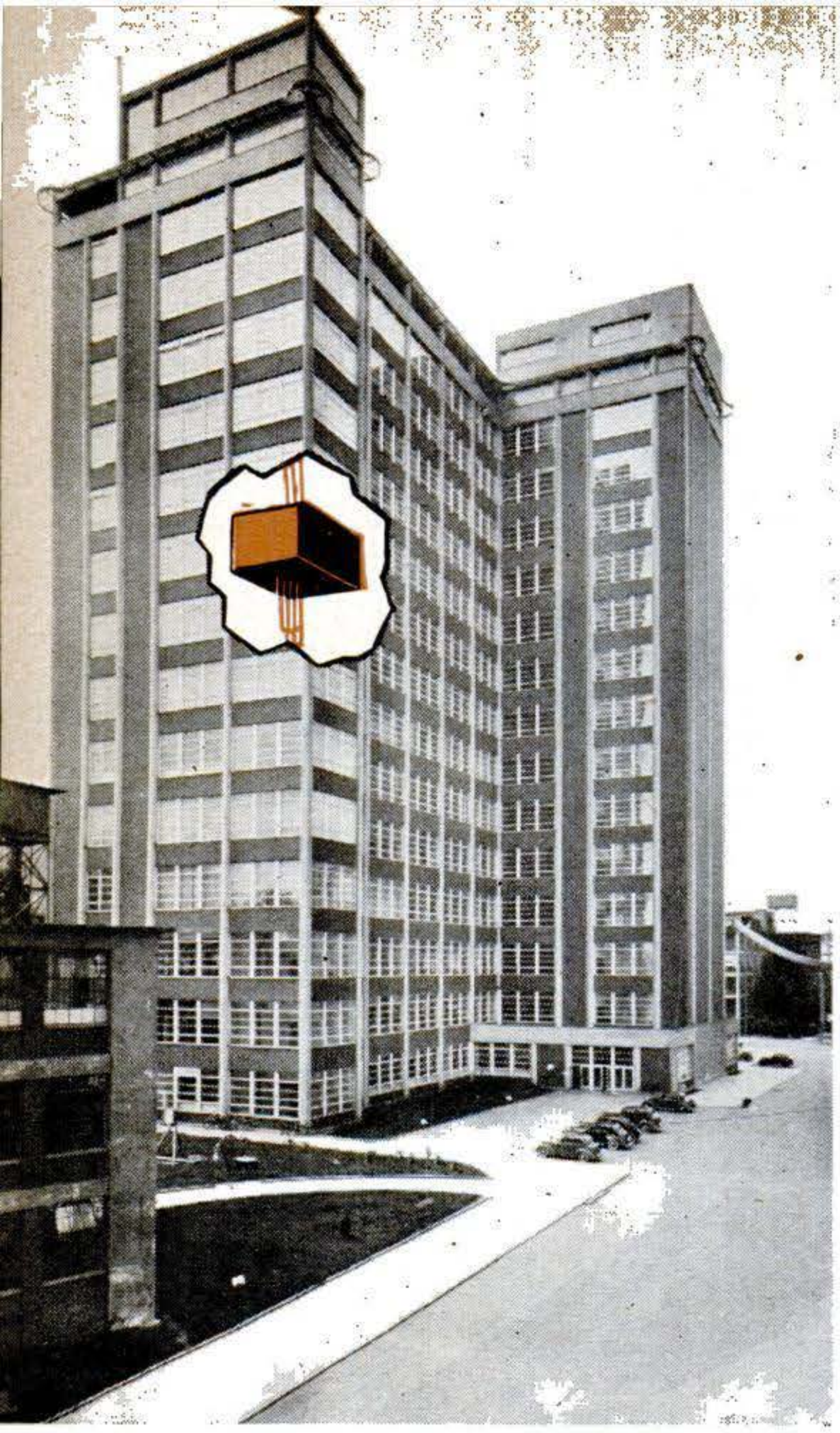
Box on balcony holds two cameras to cover stage or demonstrations on floor.

Camera in corner of stage will make close-ups of speakers, like that above.



Single camera on special platform covers stage from distance for wide view.

Colorful events outside building will be picked up by crew near entrance.



Office Goes Up and Down

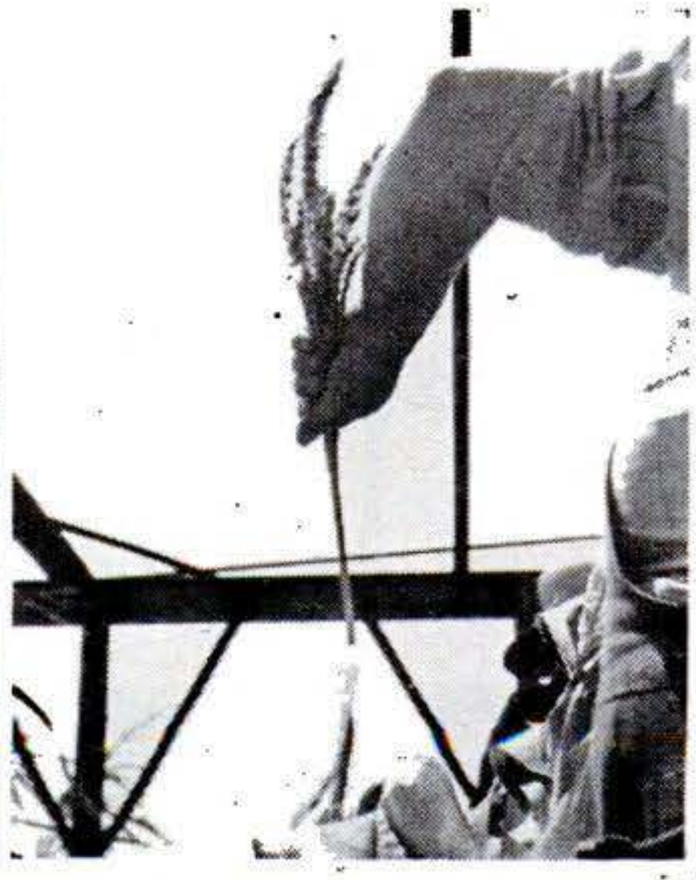
BY MERELY pressing a desk button, the manager of this factory can move his office to any of the building's 14 floors. Originally built for the head of the Bata (shoe) Works in Zlin, Czechoslovakia, the office is fitted into a corner elevator of the structure. It's believed to be the first of its kind. The corner location of the mobile office affords plenty of light through big windows. Operation is reported to be so smooth that there is no feeling of motion when the unique room goes up and down.

Cutaway above shows location of the office-elevator in a corner of the building, enabling the manager to hold conferences with persons on various floors without leaving his desk.

The 24- by 24-foot office is air conditioned, soundproof, and has running water. There are internal and outside telephone connections, as well as a plant-wide broadcasting system.

Corn Bred With Care

WHEN the time comes for crossbreeding corn to produce improved strains, the job must be done in a hurry lest stray pollen from undesirable varieties gets there first. The answer is a tractor-driven machine (left, below) that carries a group of workers through the corn fields as fast as two and a half miles an hour. As it moves along, the workers pull the tassels, as shown at right, and apply pollen by hand.



Copyrighted material

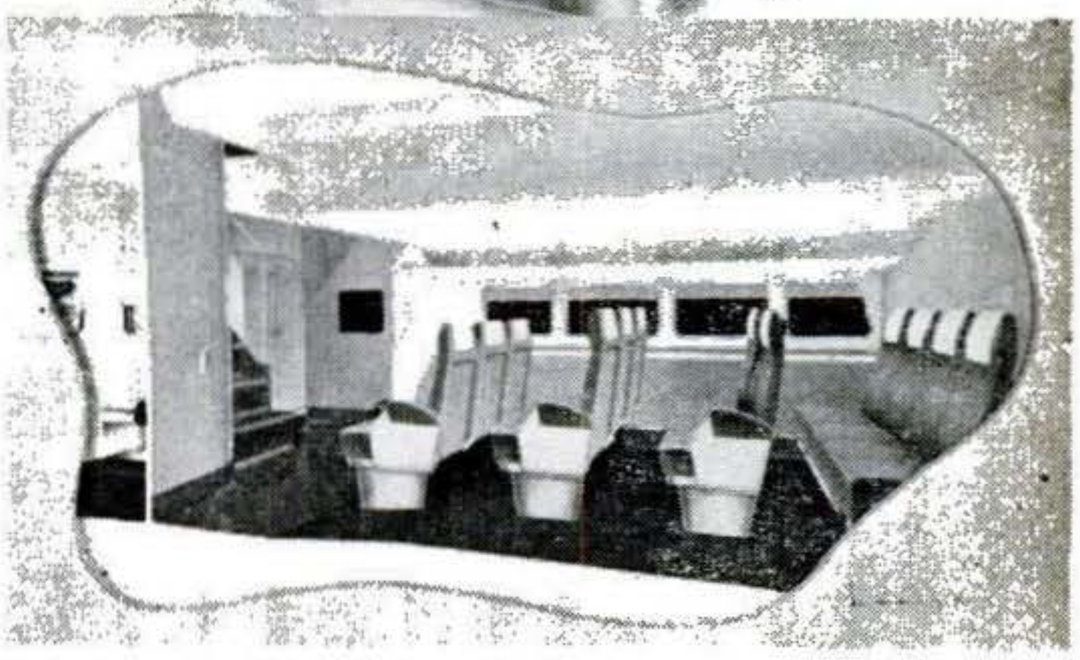
Highway Traveler Ⓣ seats 50 passengers, compared with 37 in present models.

New Bus Built For Comfort

NOW purring around the country on road tests is a Greyhound bus packed with new tourist luxuries and safety "firsts."

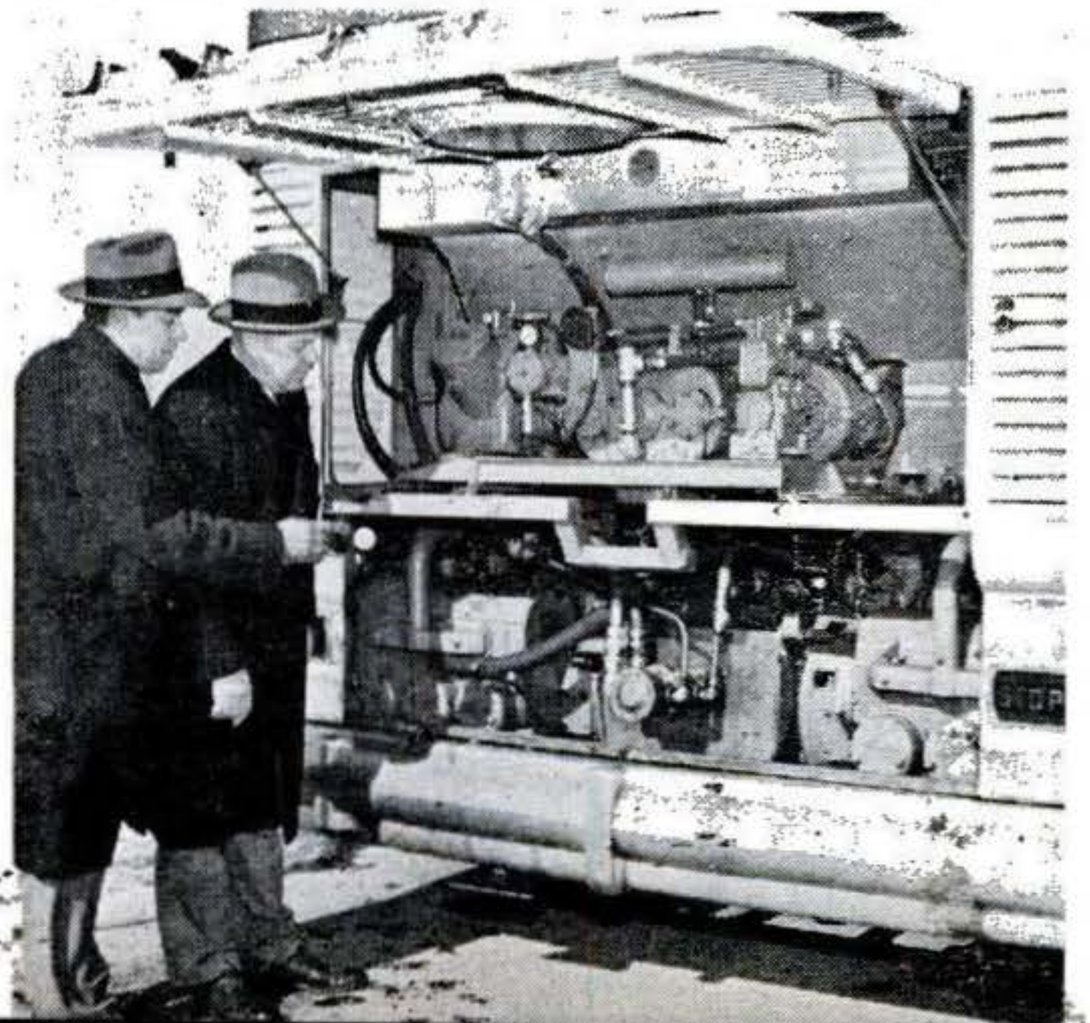
It's the first bus with a self-sealing fuel tank, first with twin air-cooled engines, one of the first with wire-cord tires to reduce blowouts. The driver sits practically in a glass dome. Both for safety and view, most of the seats are above the traffic level.

An automatic steering control prevents any sudden bump from deflecting the wheels, and a new Hydrotarder Ⓣ—a sort of fluid-friction clutch in reverse—saves brakes on downgrades.



Double-deck seating provides for 6 passengers (plus driver) in Fore Lounge and 31 in Terrace Lounge, on upper level. Thirteen more are carried in Sedan Lounge underneath. Lower level has drinking fountain, refrigerated cabinet, and lavatory. Seats are wider and windows larger than those in current buses. Individually controlled pillow-type radio speakers in headrests offer choice of two stations. Body framing serves also as air ducts for cooling and heating system. Luggage is carried in lockers in side walls, acts as shock absorbers in case of crash.

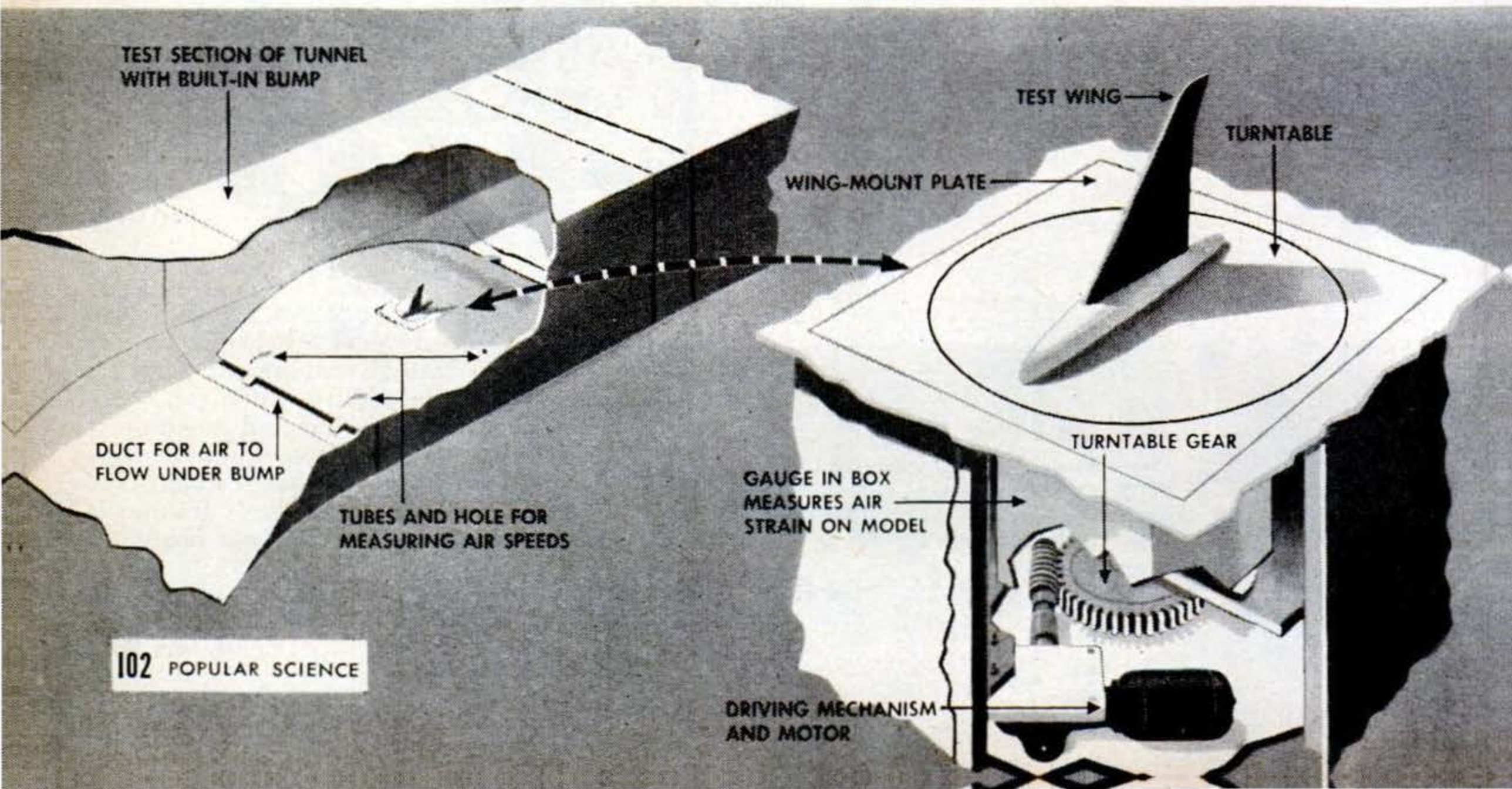
Twin engines are air cooled. One normally propels bus, other operates accessories but cuts in automatically on hard pulls. Either can keep the bus going if one breaks down.



Copyrighted material

Bump in its floor enables wind tunnel at California Institute of Technology to fill test gap between subsonic and supersonic speeds. Elusive transonic speed—exactly that of sound—is reached where air traveling slightly slower is squeezed as it passes over the bump.

How model airplane wing is placed on the bump for testing is shown in cutaway sketches below. Wing is attached to 16-inch turntable that can be rotated to change hitting angle of the wind. Bump is permanently installed on a metal cart that is rolled into the tunnel.



Planes Race Past Sound; Bump in Floor Shows How

By squeezing air in a wind tunnel, engineers help solve the problems of flight through the transonic region.

By Andrew R. Boone

FOR years pilots and engineers have worried about what would happen to an airplane that entered the terrifying region bounded by the speed of sound. Under that speed, an airplane was safe; above that speed, an airplane would be safe. But *at* that transonic speed the cockpit controls might "reverse," and a plane do just the opposite of what it was supposed to do. Transonic forces might even shake a plane apart.

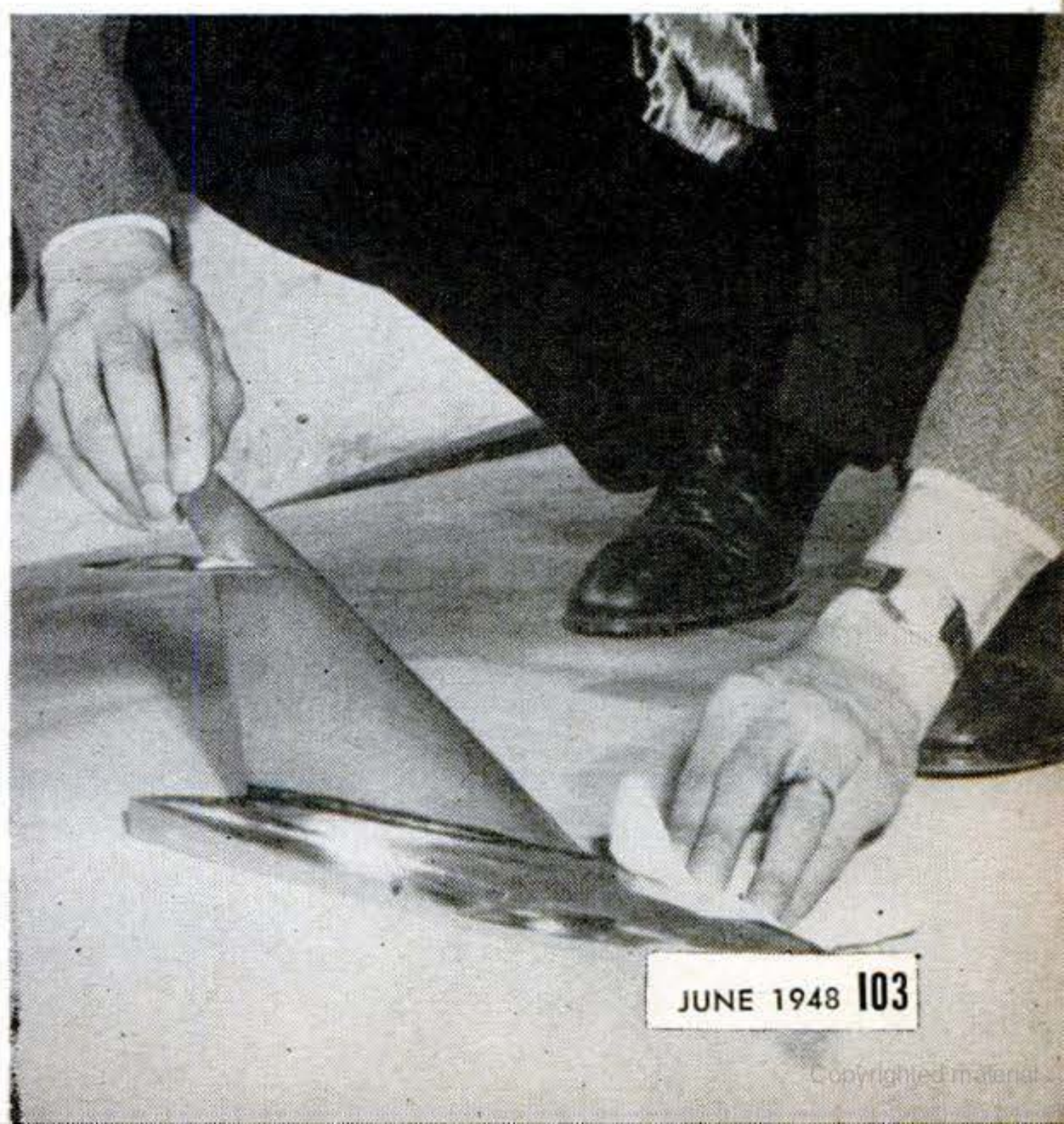
Now they know that little need happen at the speed of sound that doesn't happen normally in flight at other speeds. In fact, the government research agency, the National Advisory Committee for Aeronautics, refers freely to "the transonic research airplanes *now flying*."

The scientists have discovered what to do to an airplane to make it fly successfully into and through the mysterious transonic region. They found out by building a bump in a wind tunnel to produce an air speed equal to that of sound, and testing the behavior of model planes and parts in this blast.

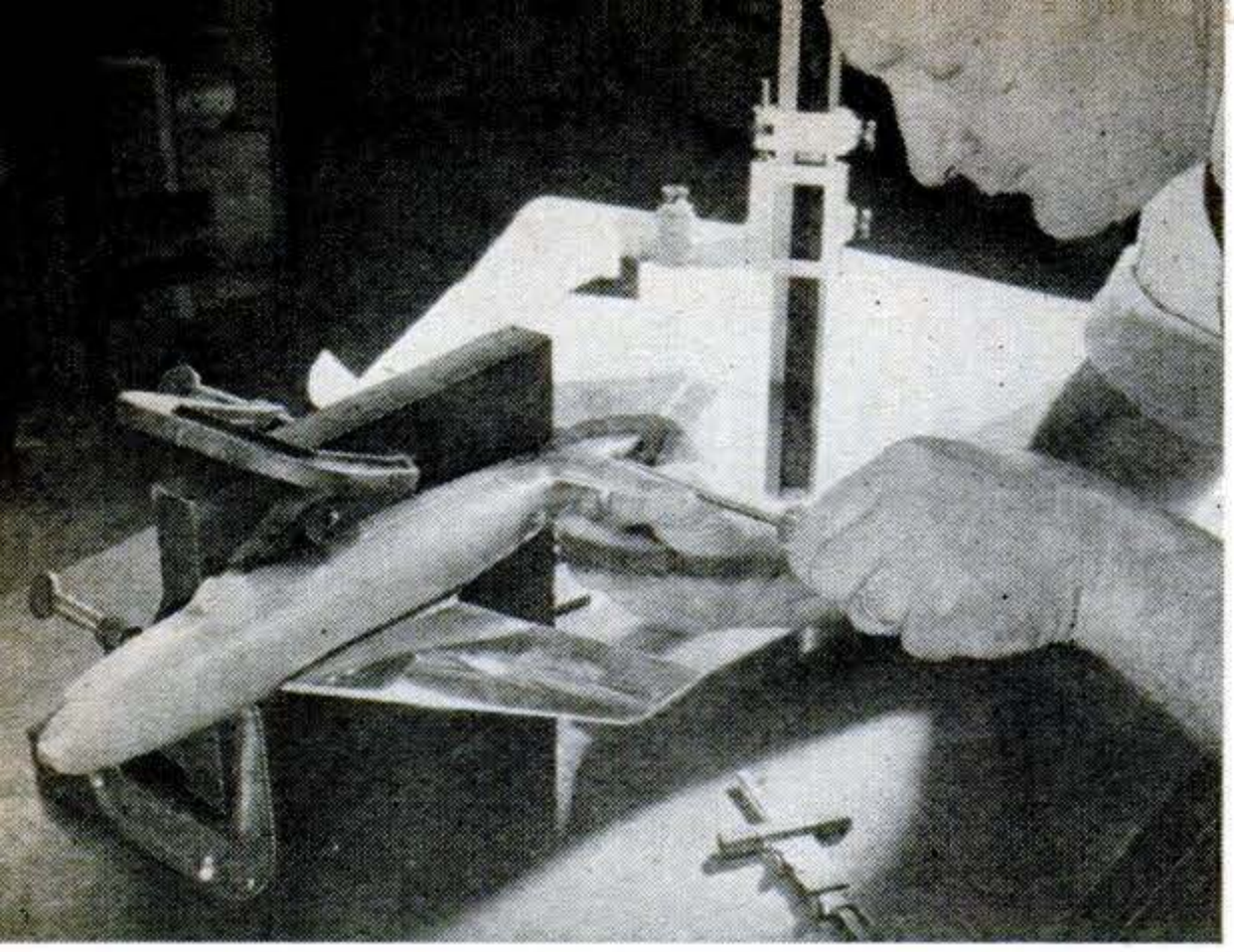
Without the bump, air blown through the tunnel flows smoothly at speeds below that of sound; but, just at that speed, it "chokes" between the walls and the test model. With the bump, air moving slightly slower than sound is squeezed up to transonic velocity for a fraction of a second just where the

Model wing is installed, below, on turntable. It has 6.8-inch span and is swept back at 60° angle. During tests, air speed over wing is measured by pressure openings on bump and in vertical plate, 10 inches high, that can be seen in photo at the top of the opposite page.

Model is polished before a high-speed test run to remove surface irregularities whose air drag would be magnified many times when readings of instruments in the wind tunnel are translated into stresses on a full-sized aircraft flown at the corresponding speed.



Copyrighted material



Model is assembled for test at transonic speed in wind tunnel with bump. Wing shown here, made of machined brass, has 5-inch span and 28-degree sweepback. Maple fuselage, shaped like that of P-80 Shooting Star jet fighter, is reinforced by aluminum strip along its base.

Miniature wind tunnel, patterned accurately to one-hundredth of an inch on the big one at Caltech, served as a working model in which these Lockheed engineers perfected bump that produces transonic air speeds. Experimental bump, of brass, is visible inside its mouth.

tunnel narrows—and where the test model is placed. Beyond the bump, the air slows up again before it has had time to choke the tunnel.

One miniature model, made wholly of metal, began disintegrating at the speed of sound—763 m.p.h. at sea level. But this was a planned disaster. By shattering its wing, Lockheed Aircraft's scientists, working at California Tech's Cooperative Wind Tunnel in Pasadena, proved that this particular design could never endure supersonic flight.

Other designs can and will. This too has now been proved. The logical design for the airplane assaulting the transonic barrier is as smooth as a torpedo.

Air 'Boils' at Speed of Sound

"In the past we have had trouble in the speed-of-sound region because air gets flustered at that velocity," says Hall Hibbard, Lockheed's chief engineer. "It acts like boiling water. But air is stable both below and above that speed.

"We have had trouble because air flows at different velocities over different parts of an airplane. A plane may be flying at 600 m.p.h., but the air must flow 763 m.p.h. or faster to get over some projection—like the cockpit cover. It's the parts of a plane, not the entire structure, that run into trouble."

So the trick is to design a plane that will disturb the temperamental air as little as possible. It will take extra-clean fuselages to pierce the transonic wall. It is also reasonable to expect, on the basis of these experiments, that these airplanes will need swept-back wings. Here's why this is so:

On the conventional Lockheed Shooting Star jet fighter, air drag suddenly goes up around the wing at 625 m.p.h. Things get worse so fast that this resistance is almost eight times as great at the speed of sound as it is at 625 m.p.h. But sweep back the wing 50° and the air doesn't start to act up until 742 m.p.h., and the resistance at sound's 763 m.p.h. is only twice as great. This means that a conventional Shooting Star would require 55,000 hp. to smash through transonic resistance; one with a wing swept back 50°, only 22,400 hp.

Wings will be thinner too, the wind-tunnel tests show, but they must be rugged. Otherwise, they may twist under pressure of the aileron and thus apparently reverse the effect of the controls. When this danger is avoided by proper design, the transonic barrier is reduced to a momentary loss of control due to air turbulence. And designers hope to get around even that by altering the tail.

"Tails present the same problems as wings," explains Paul W. Theriualt, Lockheed's wind-tunnel chief. "They are actually small wings. There will be a tendency to place the tails higher and farther from the wings, to get them away from the wake and turbulent air. Tails will probably have more sweep than the wings, so that the compressibility effect will be felt first by the wing. During that critical initial period, over in a second or two, the tail will control the airplane."

Still secret is the exact wing shape that keeps control past the speed of sound. END

Copyrighted material

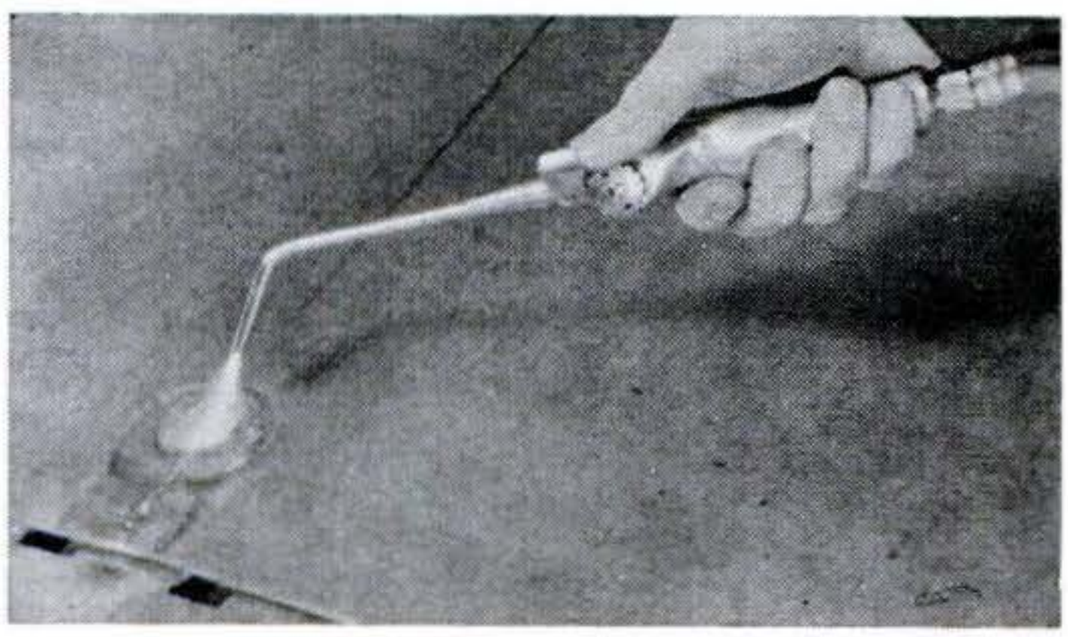
Handle Fits Your Hand

HERE'S a new kind of handle that's tailor-made to fit your hand. When your fingers slip into its grooves they do a better job of gripping, lifting, and carrying. Called the Wedge-Lock Ⓣ Handle, it was perfected by a New York industrial designer, Thomas Lamb, after anatomical studies.

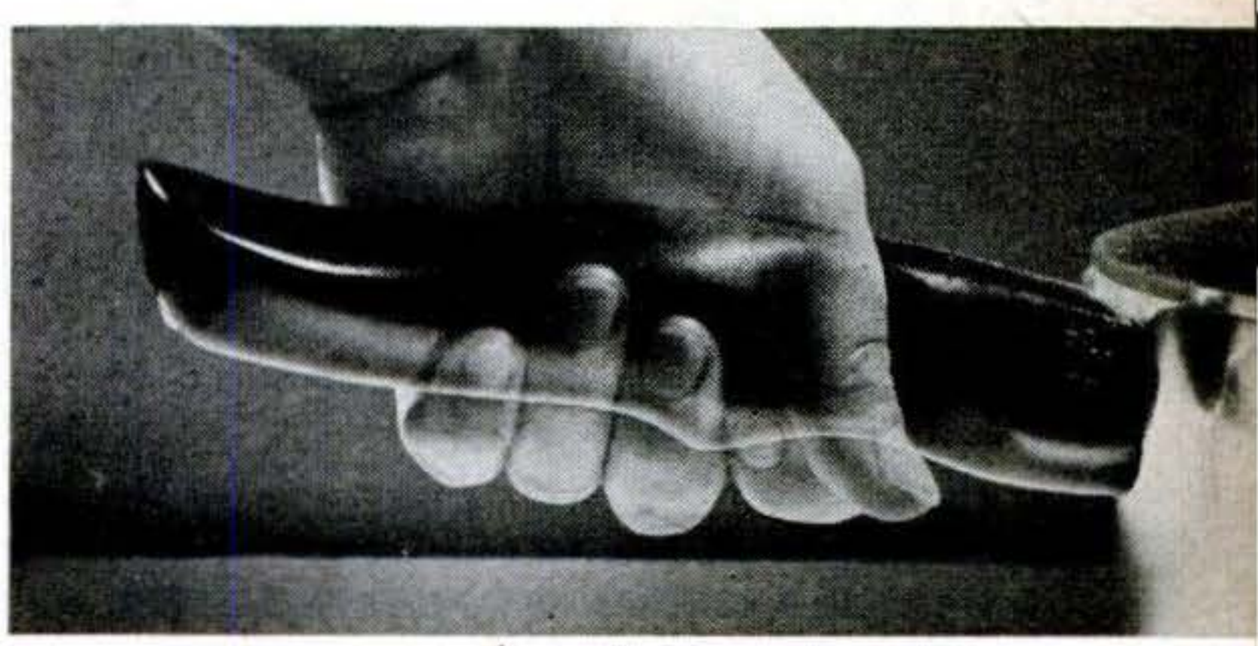
To take advantage of the thumb's full power—overlooked in conventional handles—Lamb has made separate, wedgelike grooves for thumb and index finger, and a curved gripping surface for the other fingers. This not only makes the fingers comfortable, but also distributes the work load so that each finger does its full share.

Ideal for plastics since it can be molded, the handle can be made out of almost any material, such as glass, metal, wood, or rubber. Besides present uses shown here, experiments are being made to adapt it for hand tools, tennis rackets, and fishing rods.

Ideal for pots and pans, fitted grip allows the new handle to be used safely even when hands are wet or greasy. Used as a suitcase handle (upper right) the device prevents arm cramp.

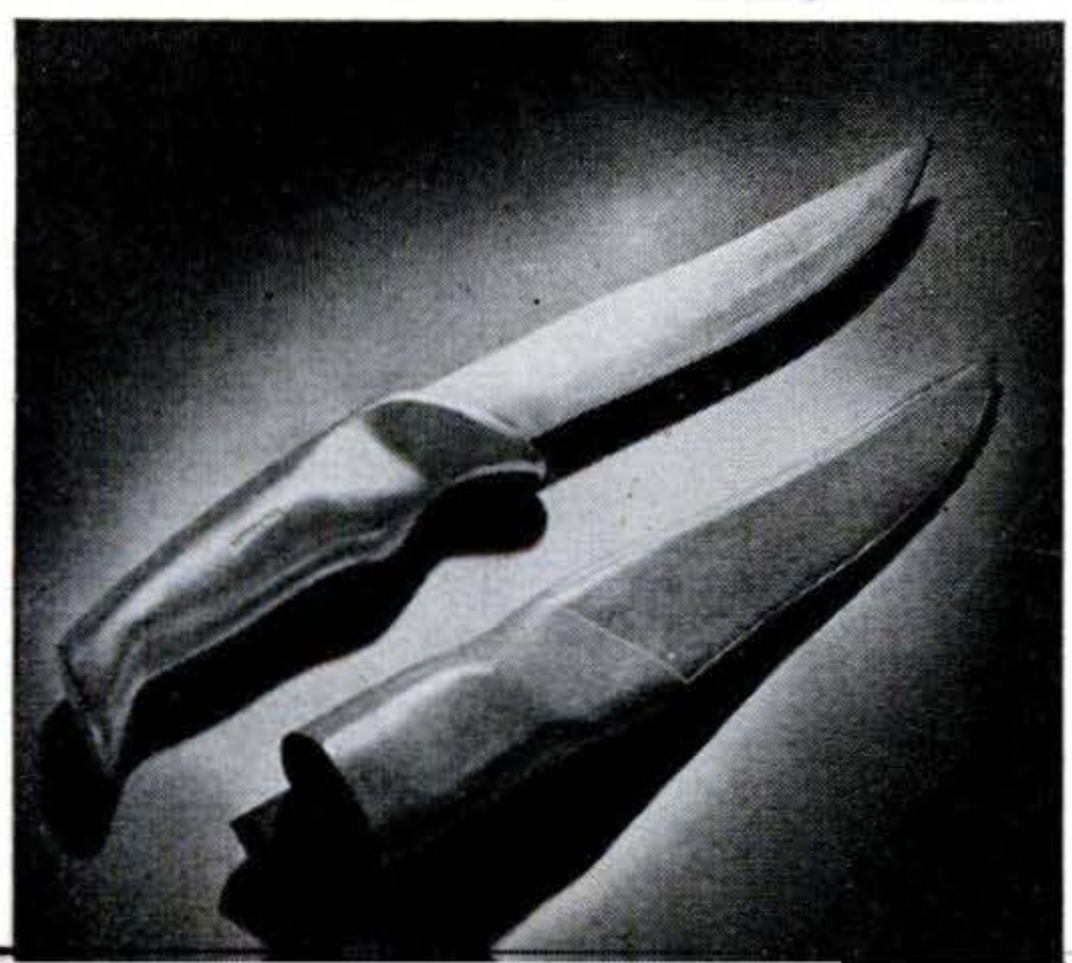


Adapted as a welding-instrument handle, the valves controlling the oxygen and acetylene are conveniently placed directly under the operator's thumb. This use is still experimental.



This phantom photograph shows how the handle equalizes stress and strain over the entire hand. Contours utilize 100 percent of hand's power during holding, lifting, or carrying.

Made of aluminum for hunting knives, the handle cannot slip, slide, or roll in the hands. Result is less fatigue in skinning operations. Sheath is made to fit handle configurations.



Worms'-eye view shows how handle narrows at base for perfect fitting of thumb and forefinger. It not only fits all sizes of hands, but is made to be used with either the right or the left hand.

It took 10 colors, plus casein size and alumina clay (in foreground), to produce this wallpaper design. Colors in front row go on first (l. to r.), then those in the second row in same order.

A staff designer puts the finishing touches on the original design before its transfer to the printing rollers. It will be reversed several times to make pattern come out the right way.

The block-cutter, working with an arsenal of tools, hammers in strips of brass, following the outlines of the pattern. Red #5 seen on roller indicates that this one will print in fifth position.

It Pays to Know Your Wallpaper

Technical progress has made new papers that can take the punishment of sunlight, water—and even the kids.

By William P. Vogel, Jr.

PS photos by W. W. Morris

THE next time Junior smudges ink, mud, or tar over the wallpaper in your front hall, don't blow your top. That wallpaper may be a modern, washable variety. If so, you can take the surface grime off with plain soap and water. And to remove more stubborn stains, you can dry clean it—just like a suit of clothes.

Advances in paper and pigment chemistry in the last dozen years have enabled some manufacturers to produce wallpaper that they are willing to guarantee for up to three years—and that guarantee may also include the cost of hanging it.

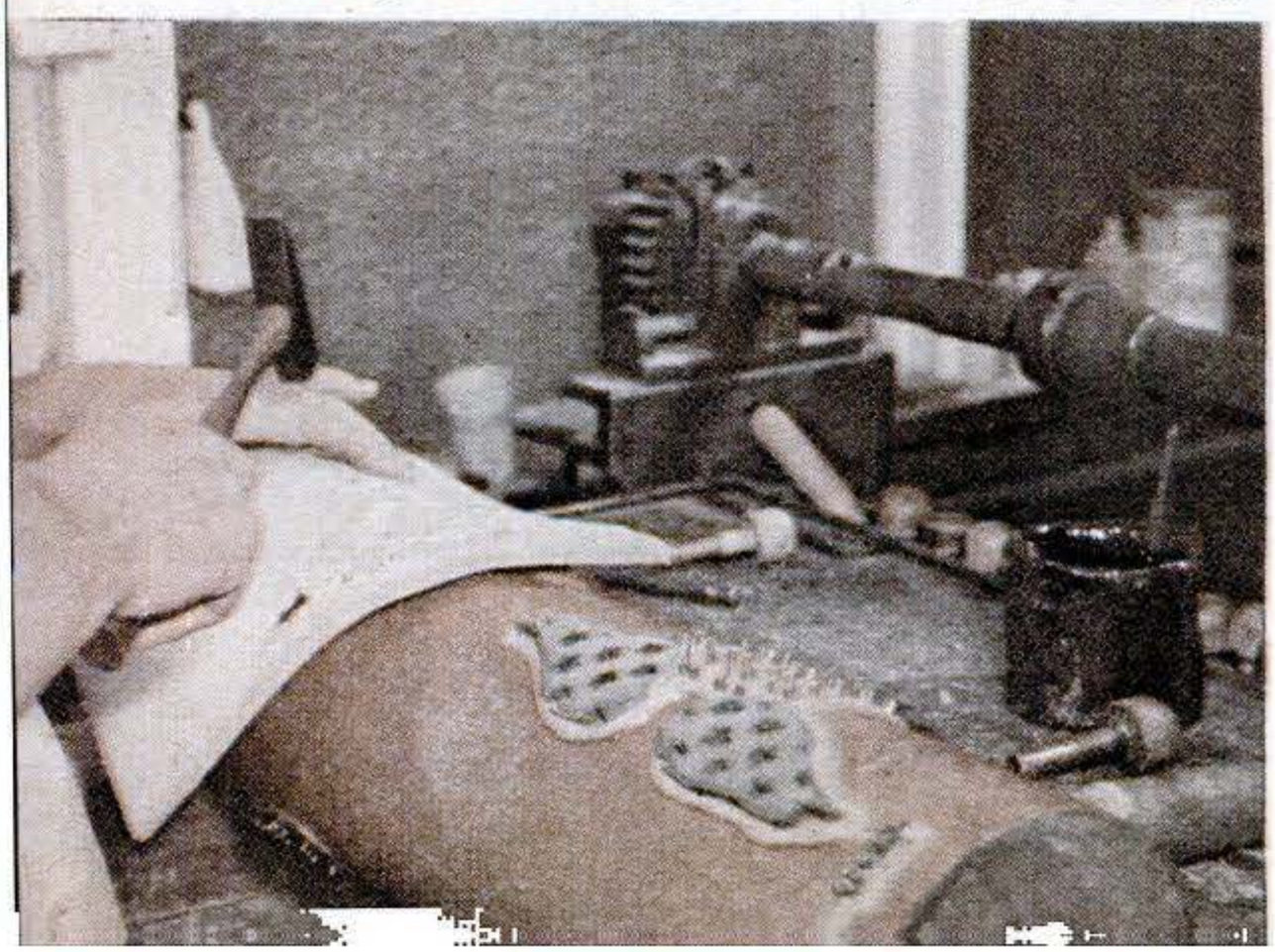
Thousands of miles of washable wallpaper, costing from 40 cents to four dollars a roll, are sold every year. By a "roll," a wallpaper man means enough paper to cover 36 square feet. The one you buy, however, is technically a "bolt," consisting of two rolls if it is 20 or 22 inches wide and three if it is 30 inches wide. Twenty-inch paper, which trims down to 18 inches on the wall, is sold in double rolls, each roll being 8 yards long. Double rolls of 22-inch paper, which trims to 20½ inches, are 14 yards long. The 30-inch paper trims to 28 inches, comes in three five-yard rolls.

Nine-tenths of the wallpaper used today is light-fast and washable. For summer bungalows, hunting shacks, and other temporary dwellings, you can buy papers that are not washable for as little as a half a penny a square foot. But for your home, the washable papers are the best bet. You can hang them in the steamiest kitchens, the dampest bathrooms, the most glaring sunporches—and even in showers if you coat the paper with a special lacquer.

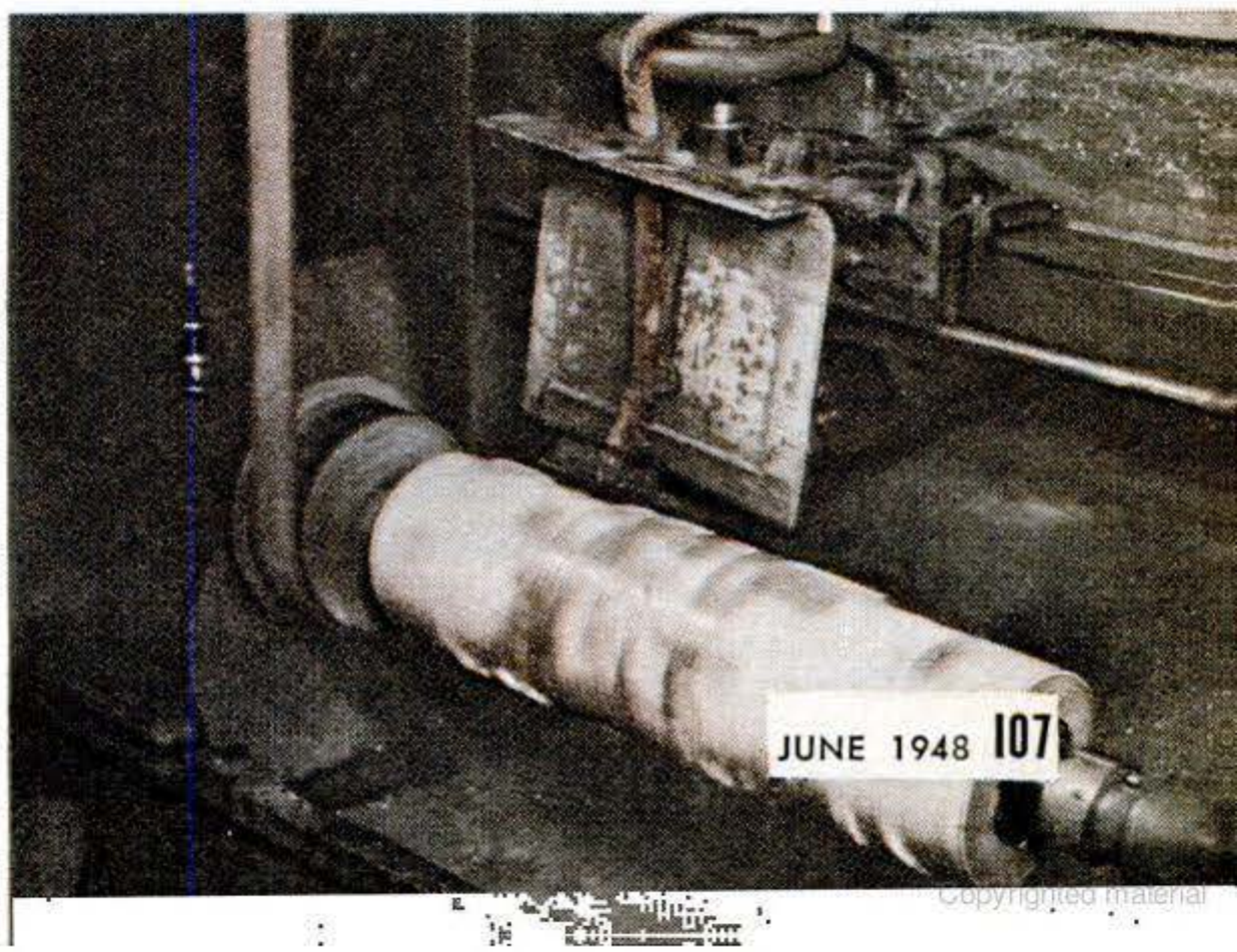
The presses that produce this wallpaper each turn out from 500 to 1,000 rolls an hour. The paper is a special stock known as "Hanging No. 2," which has just the right "feel" to absorb the color and hold it tight and to take in the paste so that the paper will hang smoothly on the wall. It is a mixture of ground wood and sulphite pulps, about four parts to one respectively. Too much sulphite makes the paper too hard.

The Imperial Paper and Color Corp., at Glens Falls, N. Y., gets most of its raw

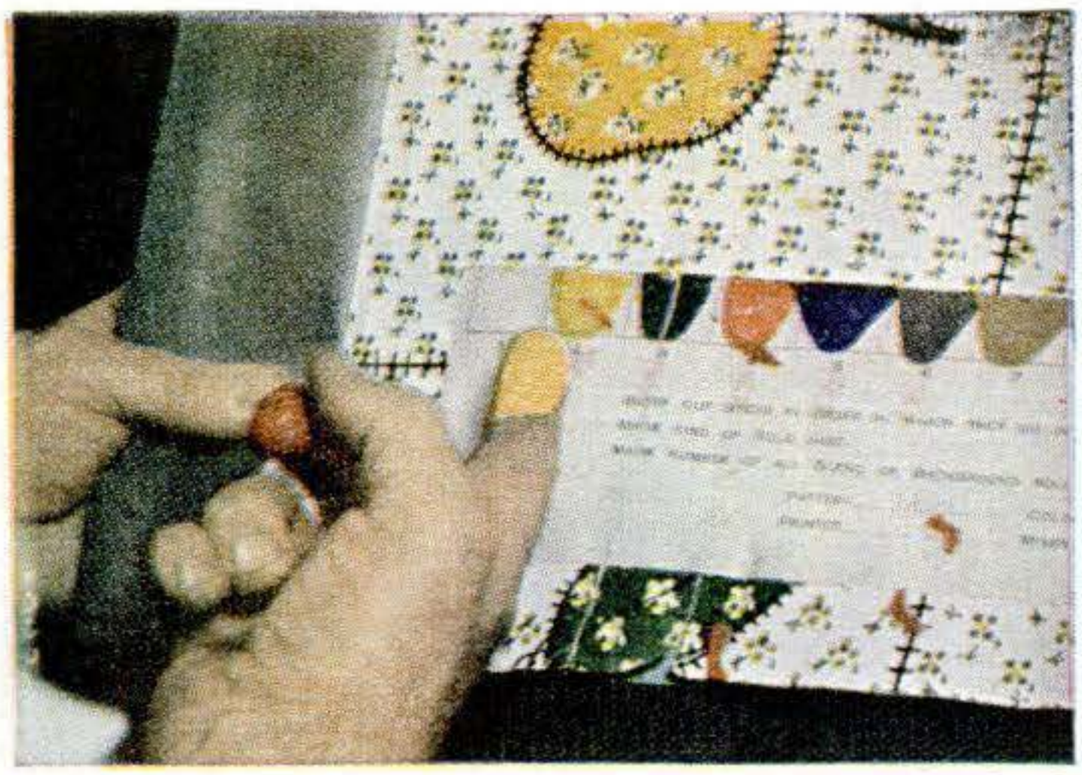
Larger spaces of solid color in between brass-strip outlines are covered with felt, which is scored, cut, and then hammered in. The felt soaks up the water color and prints it evenly.



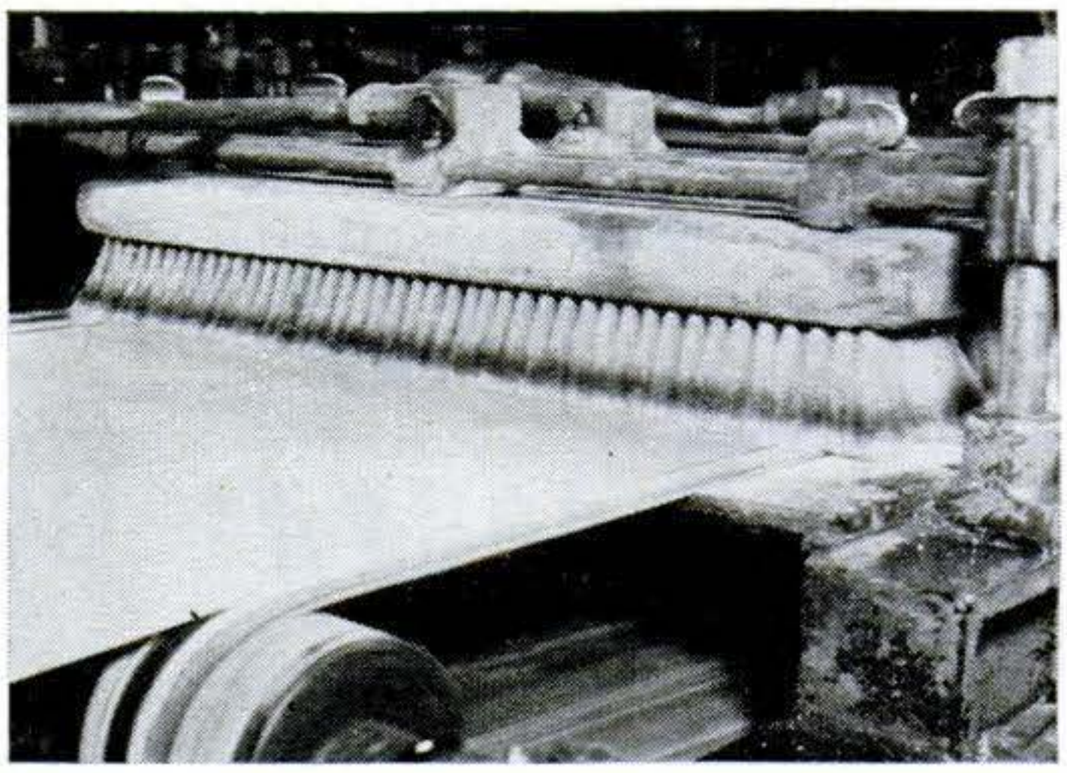
Before going to the press, rollers are smoothed on grinding lathe with pumice and water to remove any high spots that might cause uneven printing. Block of pumice is in background.



Copyrighted material



To insure exact matching, colors are checked against those of original run. Although they are darker when wet, long experience enables the mixer to tell how they will look when dry.



In first printing operation, solid background tint is brushed on with three fine-bristle brushes moving rapidly over the paper. Background coats can also be blown on under air pressure.

On the big rotary press, which can accommodate up to 12 rollers, the design colors are printed in rapid succession, the lighter tones generally preceding the darker ones. At the end of each printed reel, colors are again checked against originals for possible variations. Note that the pattern is printing on the paper upside down. Most wallpaper presses run this way.

Copyrighted material

stock from its own plant 125 miles farther north in Plattsburg. Before this paper is used, it has to jump through hoops in the test laboratory. Samples from each mile-long roll are weighed to check uniformity of texture. They are pulled apart, burst by a small rubber balloon to test tensile strength, wetted, and then dried again. These tests tell whether the paper will stretch uniformly and shrink evenly when hung.

The designs for the wallpaper have to be just right, too. Each pattern must be between 15 and 21 inches deep, so it will repeat properly, and must not have more than 12 color tints—the maximum number of rollers on a modern wallpaper press. Designs sometimes have to be changed to prevent too much overlapping of colors or a tendency to make the wall look as if it were leaning. Optical illusions make many intricate designs look quite different when hung.

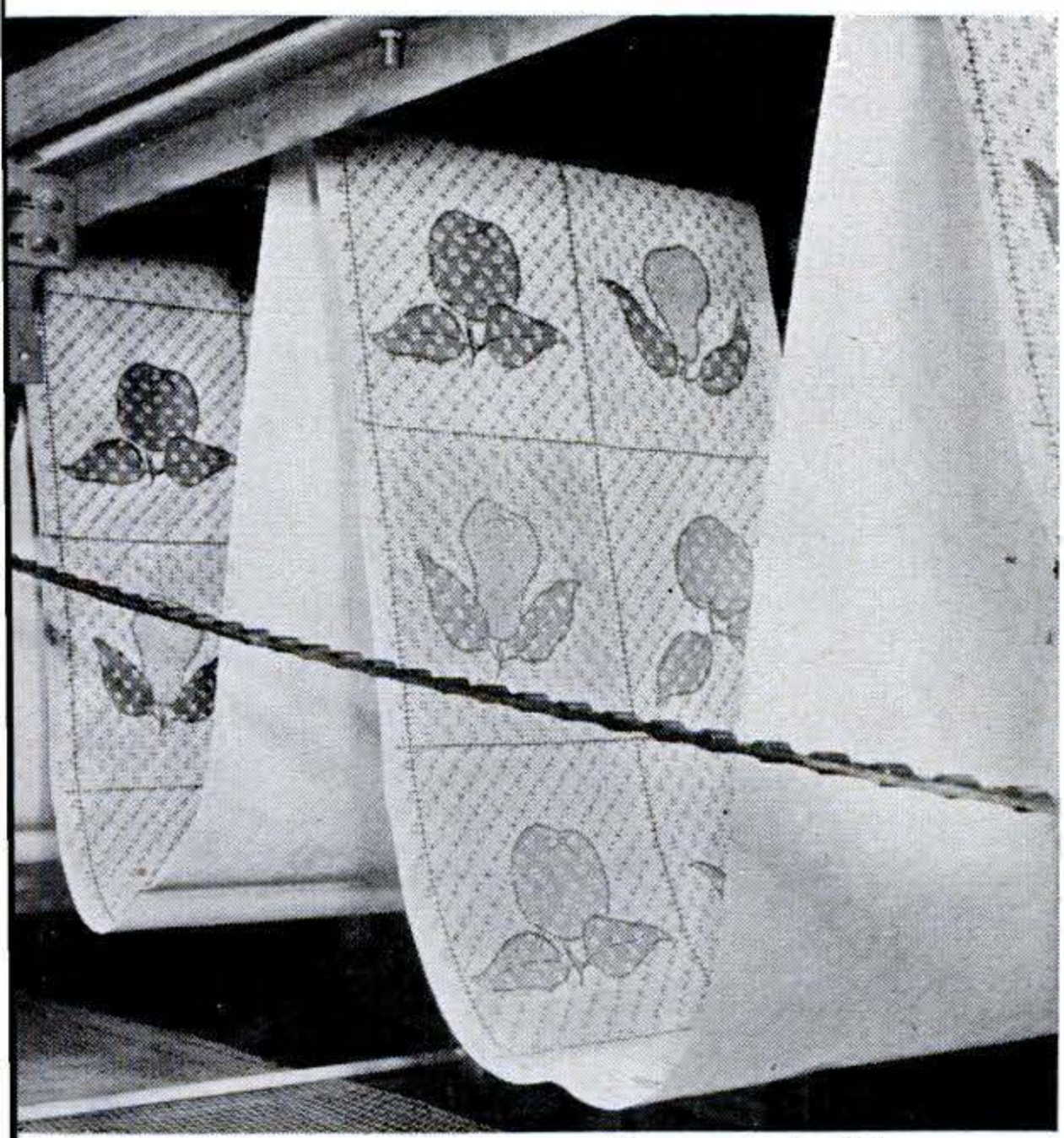
Once a design is technically right, its transfer to the printing rollers begins. Skilled craftsmen, tracing the design, etch it onto a gelatin sheet, which is then inked and pressed onto paper. The inked design is then transferred from the paper to as many hard, rock-maple rollers as there are colors used. Next, "putters-on" outline in ink the areas of one color on each roller.

A "block-cutter" then hammers in strips of brass, following the inked outlines. Small spots of color are printed directly from these, but larger spaces are filled in with fine piano felt to hold the water color.

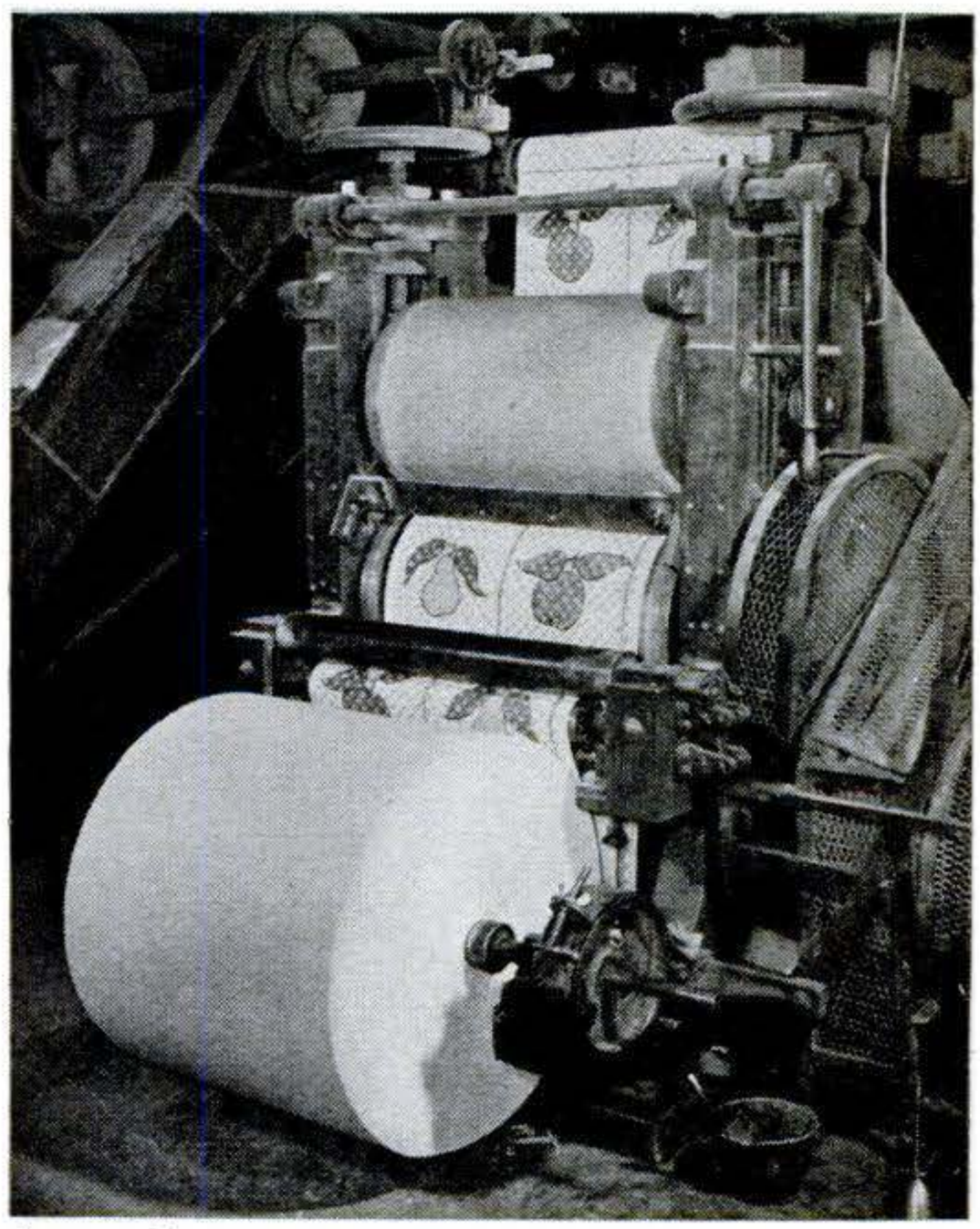
In Imperial's color house, as many as fifty different chemical pigments may be used to blend one tint. The finely bolted pigment is then added to a mixture of softened water and floury alumina clay from Georgia. To hold the color mixture to the paper, washable papers have a protein size, usually casein or soy-bean meal, while non-washable ones have a starch or glue bond.

Once the mixes are considered perfect, samples are blown out on a strip of raw stock, against which subsequent mixes will be checked, so that the paper you may buy five years from now will match that you buy today. Most papers are first covered with a solid tint to serve as a background and to protect the stock from light, which would darken it. After this ground coat is dried in a hot room (140° F.), the design colors are applied on the big rotary press.

Because the colors have to be printed wet, one after another, they must not interact chemically. Chances are that a red that "bleeds" will turn dirty brown or even bleach out to white when it strikes another



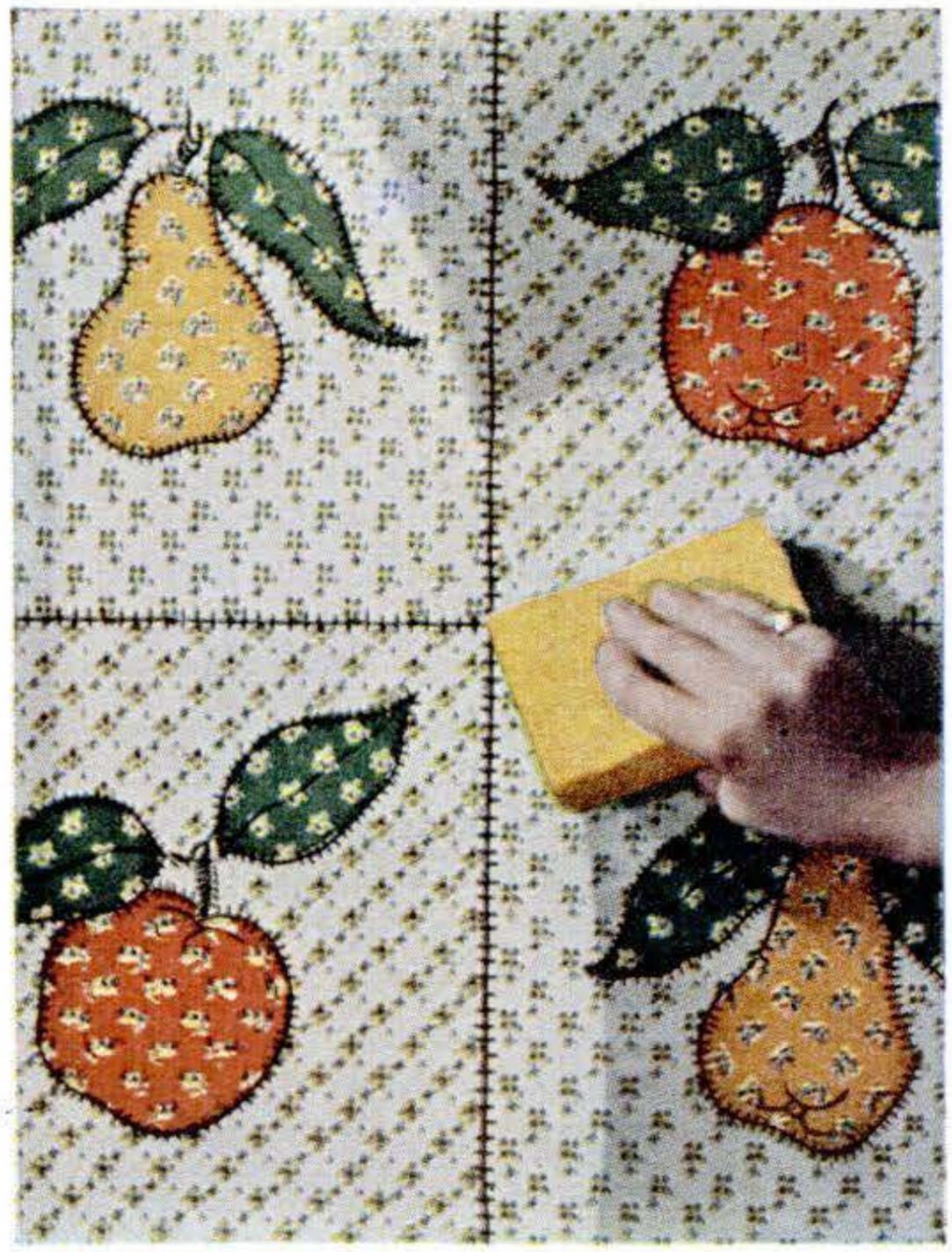
Festooned over rods, the wet, freshly printed paper snakes its way slowly through the drying room, heated by air to 140° F. Later, the dried paper will get an alum bath to make it washable.



An embossing machine presses a tiny pattern into the paper, making it softer and easier to hang. This crinkles the paper and reduces its gloss, making it more adaptable for the home.

Copyrighted material

In the final stage before shipment, the huge, mile-long reels of finished paper are cut by hand into convenient "bolts"—wallpaper jargon for the rolls you get from your local dealer.

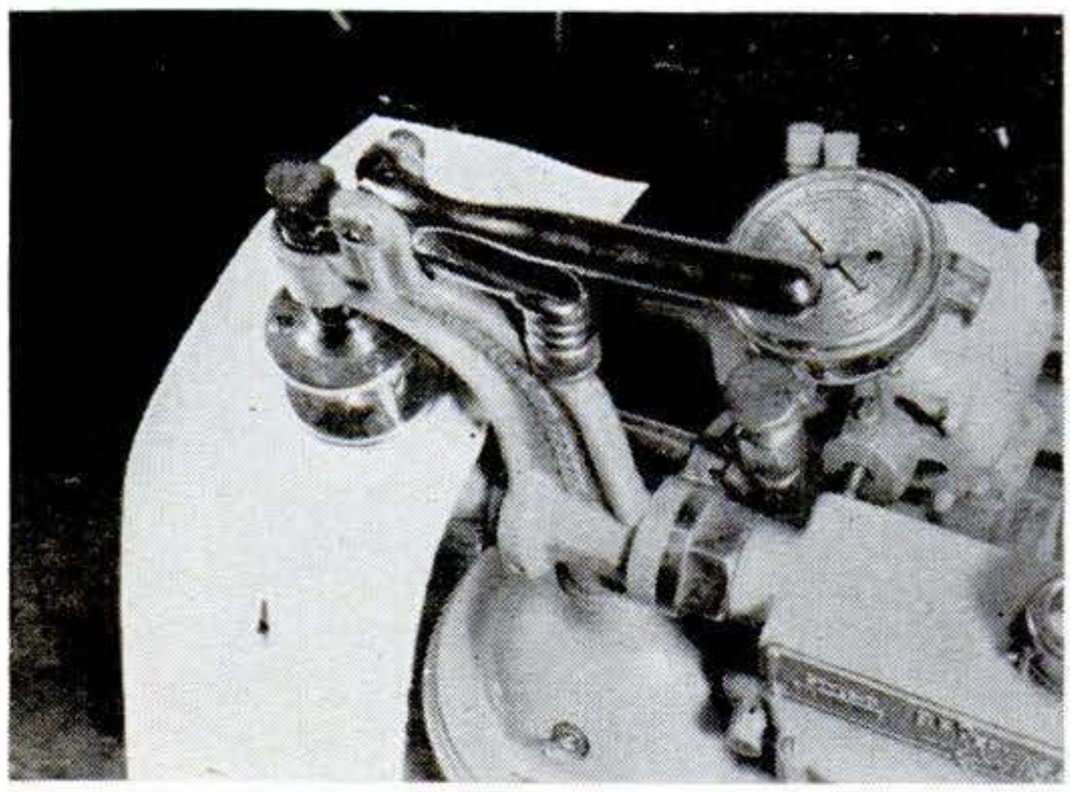


For ordinary dust or soot, a good rubbing with a dough-type cleaner will shine this paper up like new. More stubborn grime will usually succumb to any good hydro-carbon cleaning fluid.

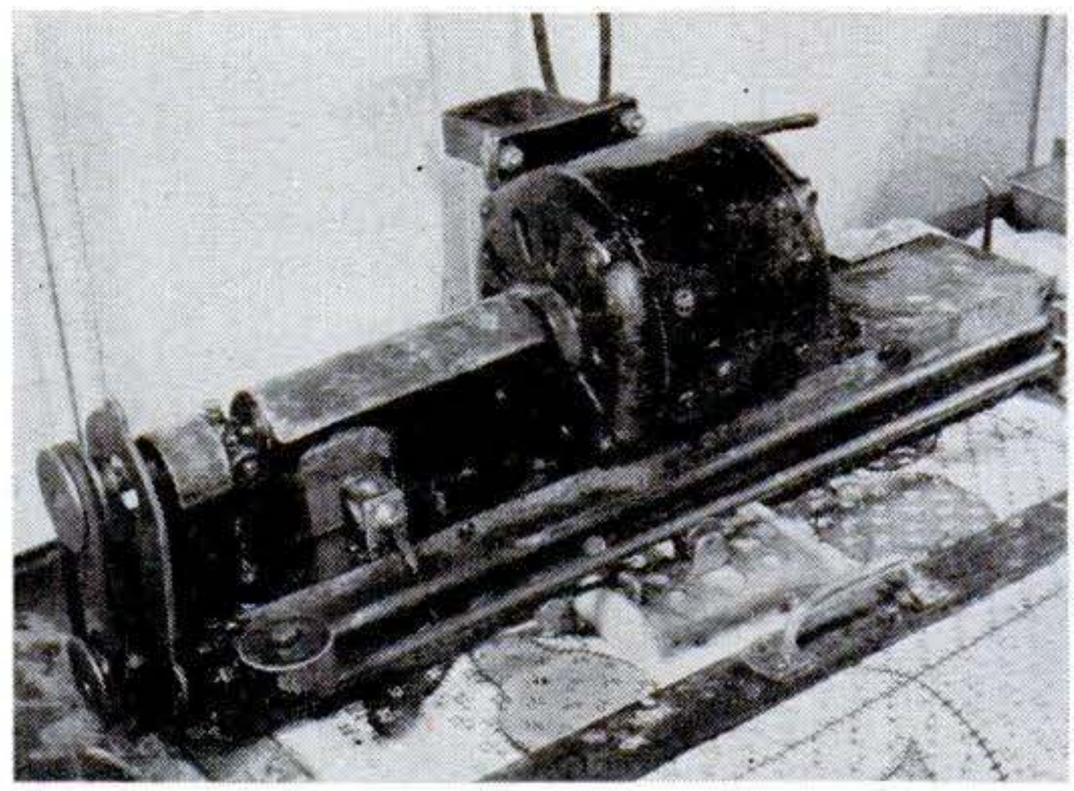
pigment. After printing, the paper is again heat-dried and the size "converted" in an alum bath to make it insoluble.

American wallpaper making has had its ups and downs. Right after the Revolutionary War, the first papers were made by hand from carved blocks, but the designs and colors were crude. After the discovery of coal-tar colors in 1860, the business took a sudden spurt, but the first colors were "fugitive"—after short exposure to the ultra-violet rays in sunlight, they faded, changed color, and sometimes vanished altogether.

Wallpaper got a bad name. Not until 20 years ago had laboratory workers learned enough to make machine-printed colors that were light-fast and papers that would not darken with age. Now, with the papers that are also washable, you don't have to repaper every time Junior goes on a crayon rampage. Just give it a bath, along with Junior, come some Saturday night. END



A "Mullen mauler" tests durability of raw stock before printing. A tiny balloon is inflated against taut paper strips until they burst under its pressure, indicating their tensile strength.



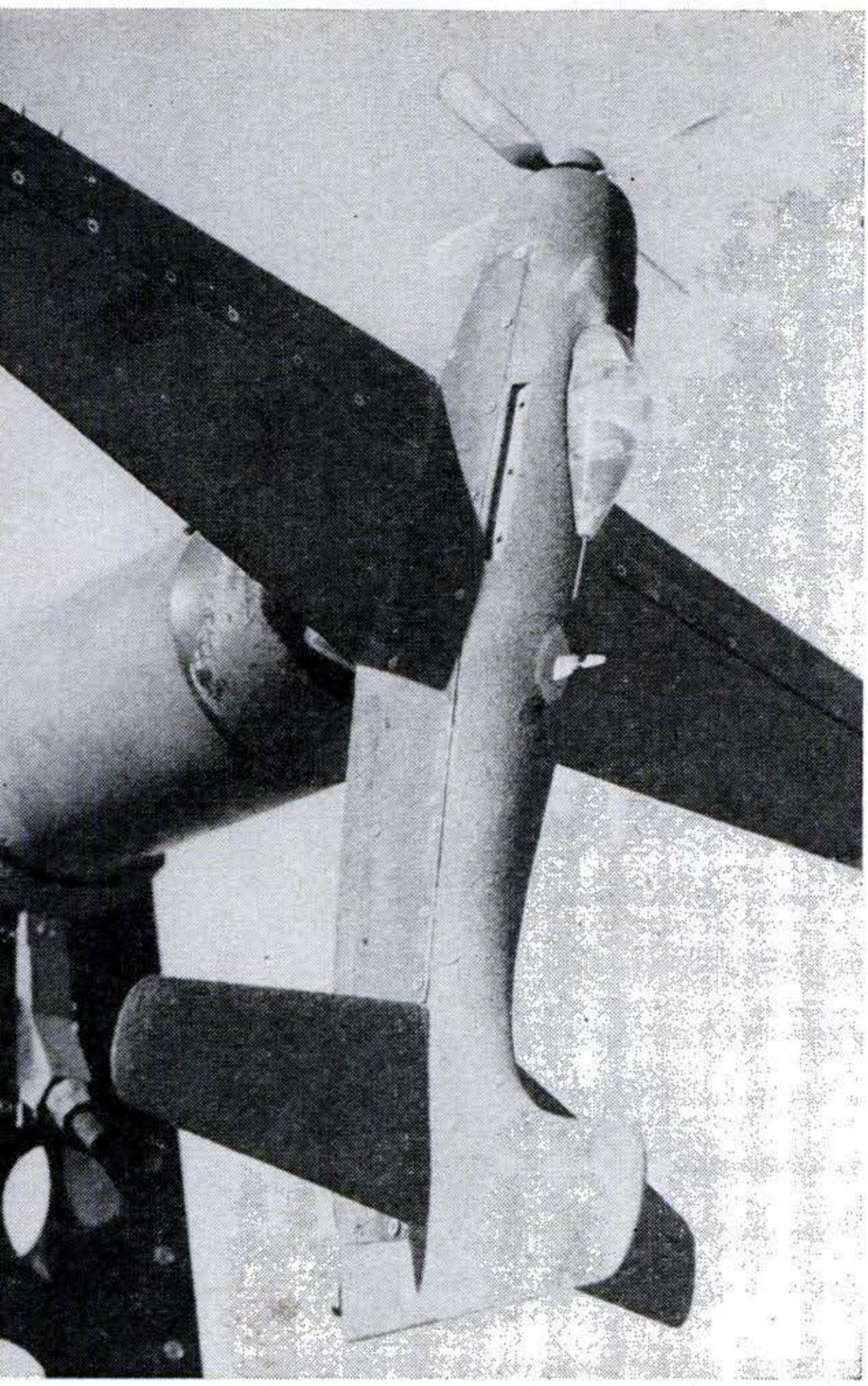
Mechanical scrubber gives samples of finished paper 200 strokes with cellulose sponge soaked in soap and water to tell how the paper will stand up under repeated washings in the home.

Copyrighted material

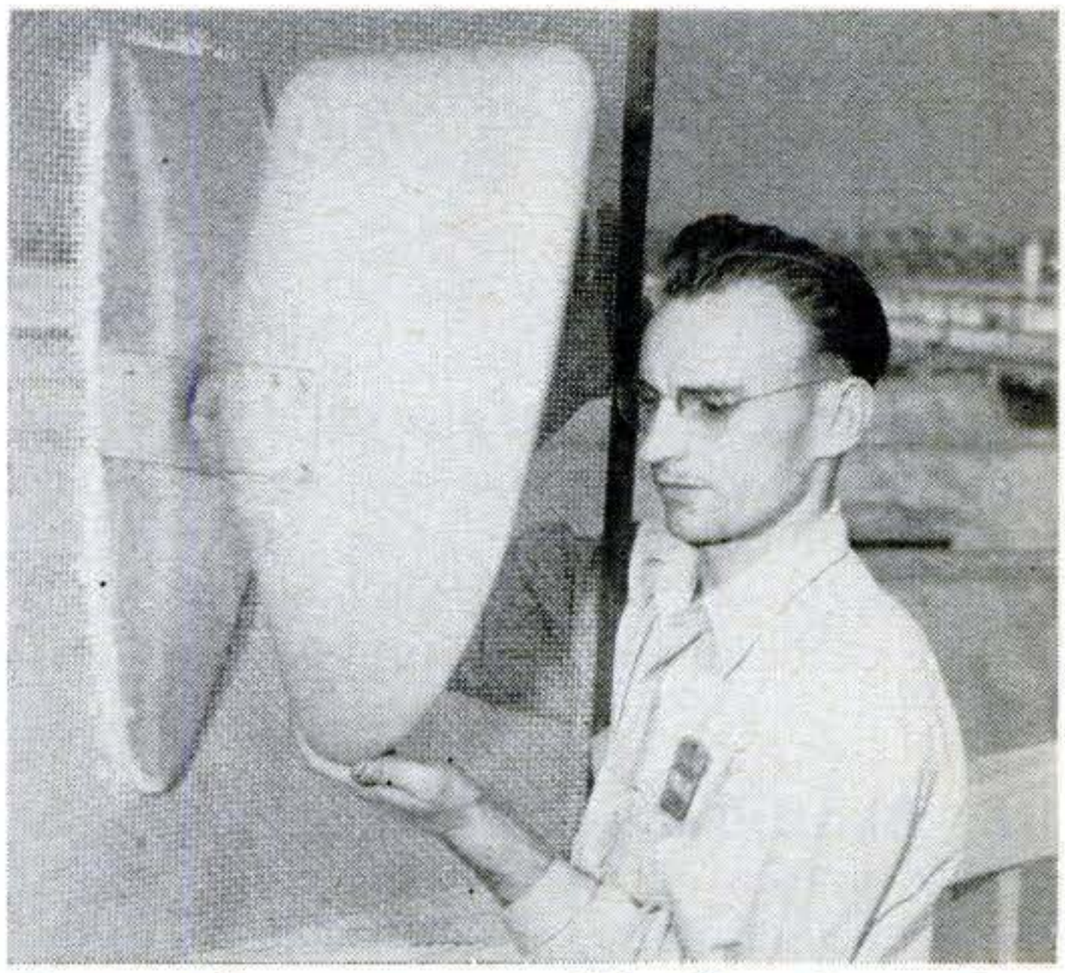
Plane Antennas Go Into Hiding

DRAG created by trailing antenna wires and stub radio masts has no place in high-speed flight. To get rid of it, engineers are hiding antennas in many ways—making them part of plastic canopies, putting them in recessed slots, building them as a part of a plane's contour.

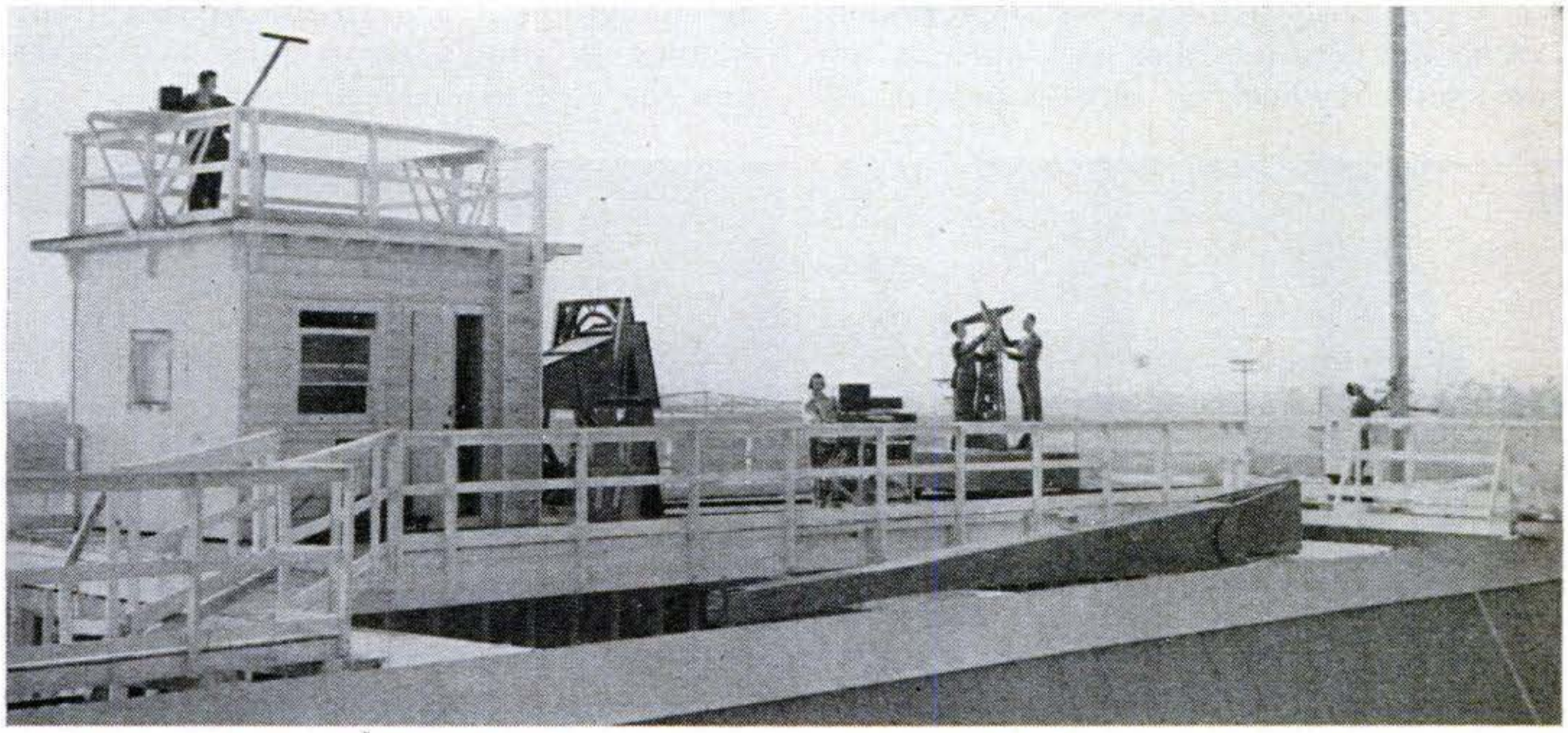
One trick is to stick them in fin-shaped cases like the Douglas designs pictured here. Thus encased in what is actually a low-drag airfoil, even a projecting antenna is no longer a hindrance.



Tiny, all-purpose antenna projects from turtleback of the model Skyraider shown here on a test stand. It creates little drag and is safe from high-speed flutter that might rip it off.



Composite antenna, capable of handling a dozen signals at once, is designed for mounting on the tip of a plane's vertical stabilizer. The wire cloth behind it helps in reception tests.



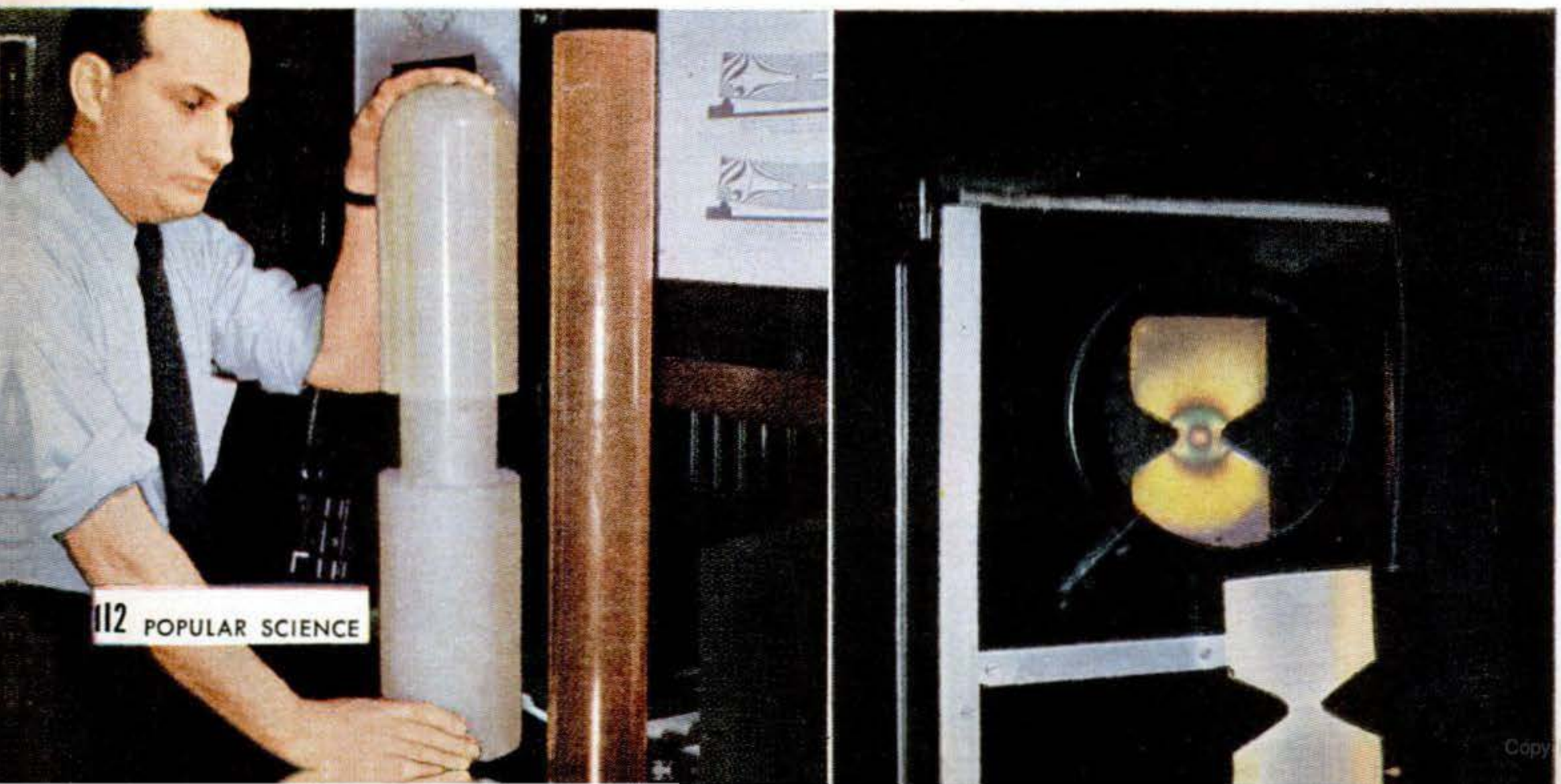
Roof-top laboratory at Douglas plant tests new antenna shapes. Angled horn beside building sprays model planes with broadcasts of various frequencies to learn best positions on plane.

Copyrighted material

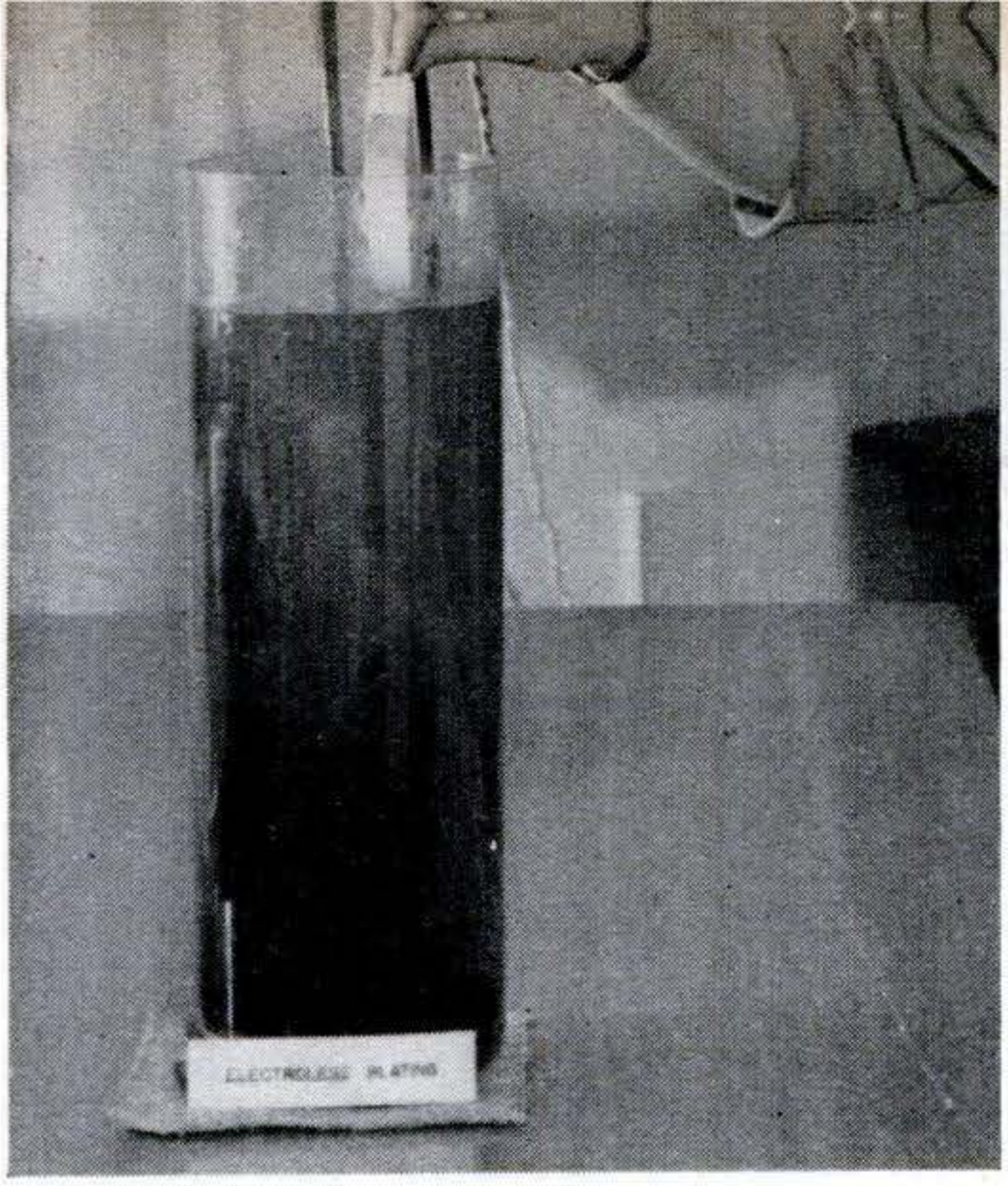
Army Grows Biggest Crystal. The 15-lb. crystal above is said to be the largest of its kind ever grown synthetically. Army engineers at Fort Belvoir, Va., made it from thallium bromide and iodide. Transparent to infrared rays that optical glass stops, the crystal will be used to make special lenses and spectrometer prisms and windows. German wartime researchers developed thallium-compound crystals.

Big Models Get Color Test. Design engineers can now build king-size test models. The two big plastic cylinders at left below are shown in comparison to what was formerly the biggest usable slab, 1¼ inches thick. A modified form of Fosterite Ⓣ can be cast in chunks 10 to 20 times larger than resins previously available for such models.

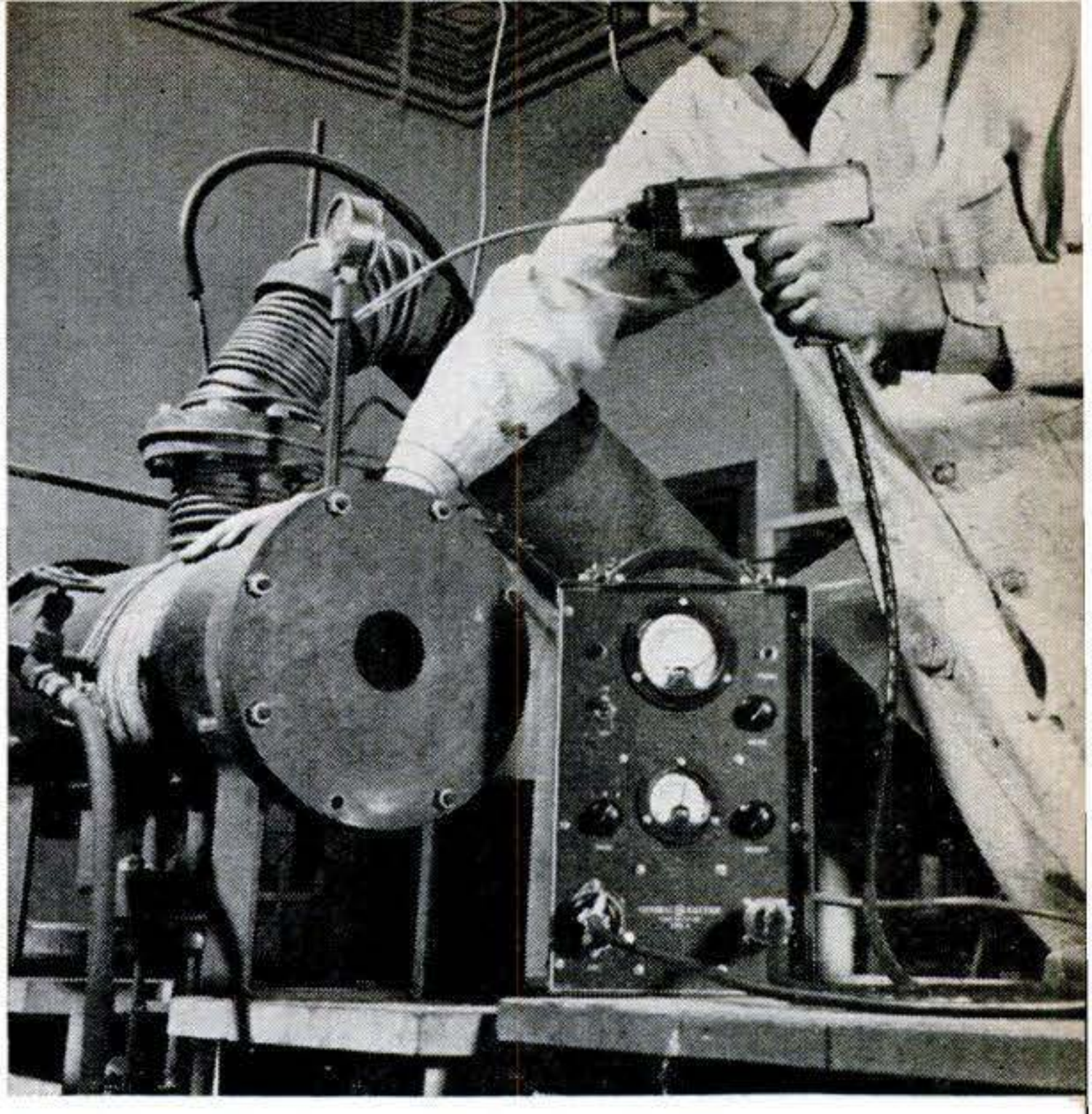
A model of a machine part—such as turbine shaft, flywheel, or rotor—is heated and strained in the same way the original would be in use. It is then cooled before the strain is removed and the stresses are "frozen in." As shown at right below, you can see these stresses as color patterns when you look at a slice from the model by polarized light. A slice of a strained specimen is in the foreground. Knowledge of the strains enables Westinghouse engineers to redesign the part to make it stronger.



Copyrighted material



Plating Without "Juice." Nickel plating now requires no electric current. A chemical method developed by the National Bureau of Standards uses the action of hypophosphite on a hot solution of a nickel salt to form a hard metallic coating. This particularly simplifies plating cavities and the insides of tubes, where electroplating requires a centered internal electrode and special current leads. Demonstration rig, above, uses current only for a heating element.



Sniffs Gas Leaks. This GE electronic "pistol" spots a leak of as little as 1/100 ounce of gas a year. Air drawn into a sampling tube hits a hot anode emitting positive ions. If a halogen gas is present, the anode's ion output rises, and the tube's current output jumps, giving a visible or audible signal. With freon, chloroform, or other gases containing a halogen—fluorine, chlorine, bromine, or iodine—as a tracer, the pistol can find leaks in tanks or pipes.

Ship-Hider Fights Bugs. Once used to screen warships, this mobile fog generator has been adapted to attack insects. Mounted on a jeep, as shown below, it emits a dense white vapor over lawns, hotel grounds, camp sites or farm lands. The insecticide is said to reach corners that sprayers miss, and to do the job at about 1/20th of previous costs.

Inside the generator, developed and adapted by Todd Shipyards Corp., a blast of hot air atomizes the DDT solution and projects it through a swivel nozzle. Veterans have built a profitable business "custom-fogging" yards of homes in mosquito-plagued districts at $1 to $1.50 a treatment. With an extension hose on the nozzle, the same machine rids the interior of a building of flies, termites, bedbugs and spiders. Periodic treatments keep an area free from pests.

Porcelain Skin Protects Prefab

Built for comfortable living, the new Lustron house has an upkeep cost that goes easy on your pocketbook.

NO REPAIRS, no redecorating, no painting—that's the claim made for the Lustron ⓣ house, a new type of prefabricated home. Its inside and outside walls are made of porcelain-enameled steel panels fitted to an all-steel framework.

The manufacturer, Lustron Corp., of Columbus, Ohio, says the panels will not scratch, crack, rust, fade, corrode, or deteriorate in any way. An over-all soap and water treatment will give you the equivalent of a painting or redecorating job.

The interior walls are double, to provide ample storage and closet space. A bedroom wall, for example, has two double clothes closets, a shelved closet, built-in mirror and dressing table, several drawers, and 48 cubic feet of extra storage space.

The company expects to turn out 30,000 of the homes a year. The price quoted for a five-room-and-bath house is $7,000 erected and ready for occupancy. This includes bathroom fixtures, plumbing, and electric wiring; lot and landscaping are extra.

Ceiling panels are locked together with tongue-and-groove flanged edges. Heat from the furnace is forced into a six-inch space above the panels, extending over the entire ceiling. The panels absorb the heat and radiate it downward. The house is built on a reinforced concrete floating-slab foundation. Exterior wall panels have 1½-inch-thick spun-glass insulation.

Copyrighted material

Exterior of the new Lustron house is an adaptation of modern ranch-house design. It has two bedrooms, living room, dining room, and kitchen. Covering an area 35 by 31 feet, it will be erected on the site by local builder-dealers in less than 100 man-hours. Purchasers will be offered a choice of six different interior arrangements and six color combinations.

Typical living room, showing built-in bookcases. Another feature of the house is an automatic clotheswasher-dishwasher built into the kitchen sink. An oil-fired (or other type) heating plant is in a utility room next to the kitchen that can also be used for drying clothes. Porcelain-enamel wall finish is unaffected by sunlight, salt water, chemical fumes, or smoke.

Copyrighted material

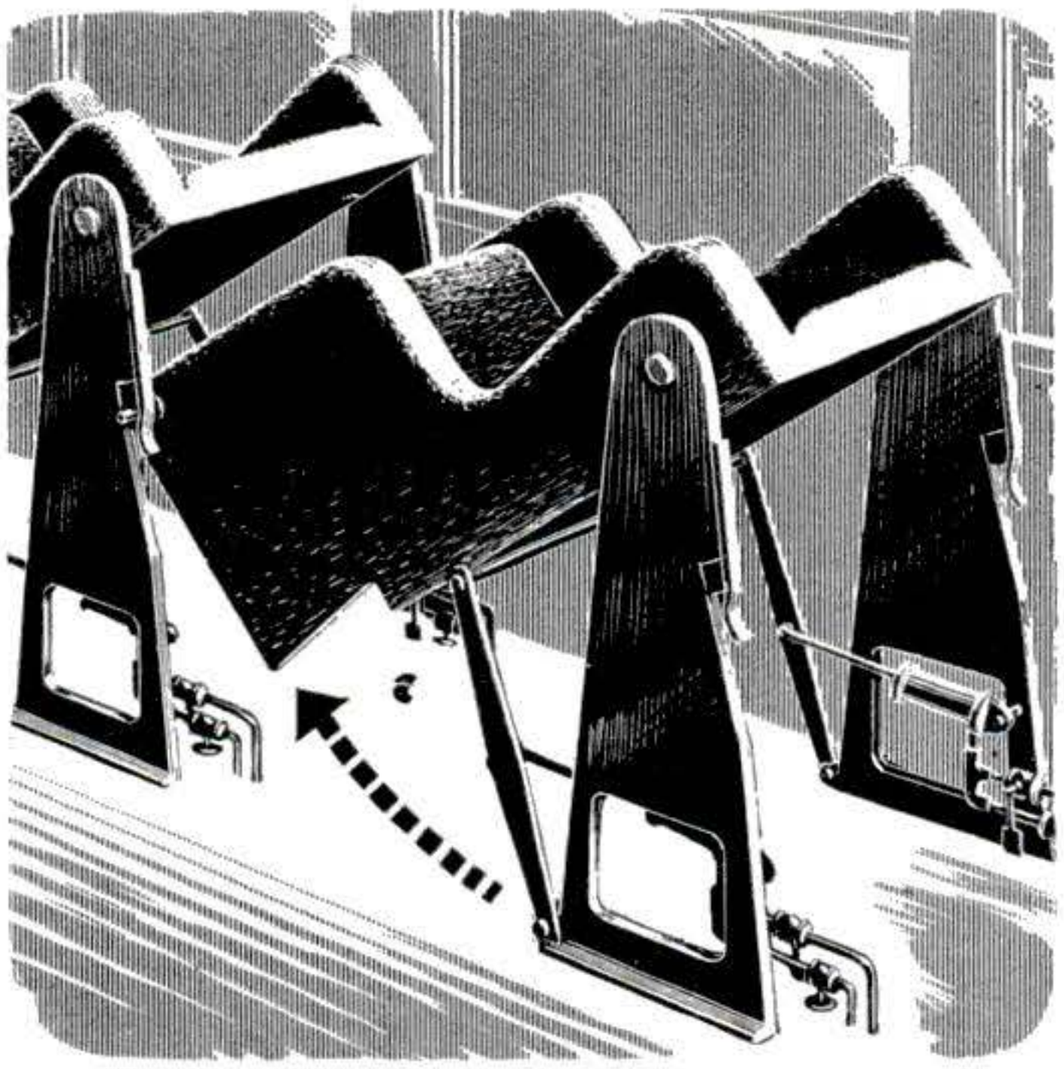
New Ideas from the Inventors

Mechanized Restaurant. Assembly-line feeding is the object of this novel lunch counter. Diners, seats, and counter would all move slowly down each side on endless conveyer belts, while different courses of the meal are served along the way. Dumb-waiters carry up the food from a kitchen below. Its English inventors, T. Lewis, E. Rounce, and C. Dunham, claim the device will increase serving capacity.

Brush Scraper Fits Can. This handy brush scraper might not improve your painting, but it would keep your paint cans neater. Invented by Robert Ferguson, of Bristol, Tenn., it clamps onto the top edge of the can and prevents the excess paint, scraped off the brush, from running over the side. It can also serve as a brush rest.

Thimble Guides Yarn. If you're a knitting enthusiast who likes to wrap the yarn around a finger to keep it taut, you'd find this spiral-ringed thimble a big help. Patented by Jeanette Lloyd, of New York City, it takes several turns of yarn and keeps it under even tension, preventing it from cutting into the finger or slipping off.

Copyrighted material



Crash Seat Cuts Impact. This safety seat swings upward in a crash to soften the impact and keep its occupant from being thrown forward. Designed for planes, trains, or buses, the seat is operated hydraulically by a pendulum valve whenever a crash or sudden stop swings the pendulum forward. Once the seat is up, bottom cleats lock to the back of the seat ahead, holding the occupant nearly horizontal. The inventor is Donald Henderson, of Hollywood.

Leg Rests Ease Kneeling. Greater comfort for workmen who must spend long hours on their knees is the claim for these strap-on leg rests, patented by Robert Ferguson, of Bristol, Tenn. Padded cups at the top cushion the knees, while supports at the bottom take the strain off ankle and instep by raising the feet and allowing them to remain in a normal position. When not in use, the supports can be folded against the shin pieces to keep them out of the way.

Crank Powers Water Sled. You'd have a hard time keeping Junior out of the water if he had this hand-propelled water scooter, invented by Ralph Bates, of Yonkers, N. Y. Turning the crank handles, like bicycle pedals, spins a small tractor propeller, pivoted in front for easy steering. Cork floats in front and back keep it afloat.

Copyrighted material

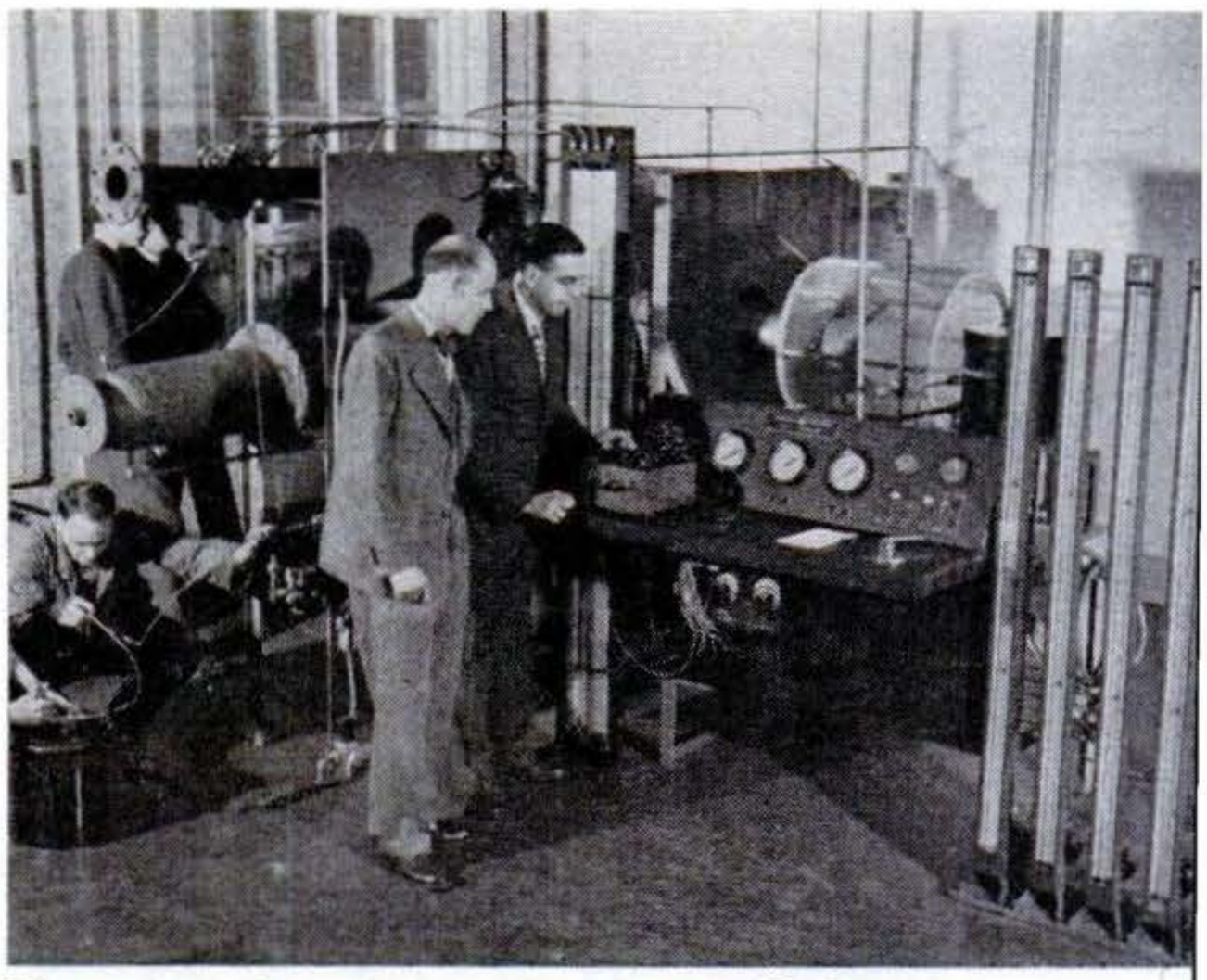
Jet Goes to College

JET propulsion is more than theory to engineering students at Rensselaer Polytechnic Institute, Troy, N. Y. They go from classrooms to a laboratory where they can study a working gas turbine at firsthand.

The equipment, designed by General Electric, is built around a war-surplus turbosupercharger from a B-29 Superfortress. It has a combustion chamber, compressor inlet flow nozzle, compressor discharge, control, and other accessories. Installed in the school's Mechanical Engineering Department, the unit is used to familiarize the students with the performance and characteristics of the gas-turbine cycle.

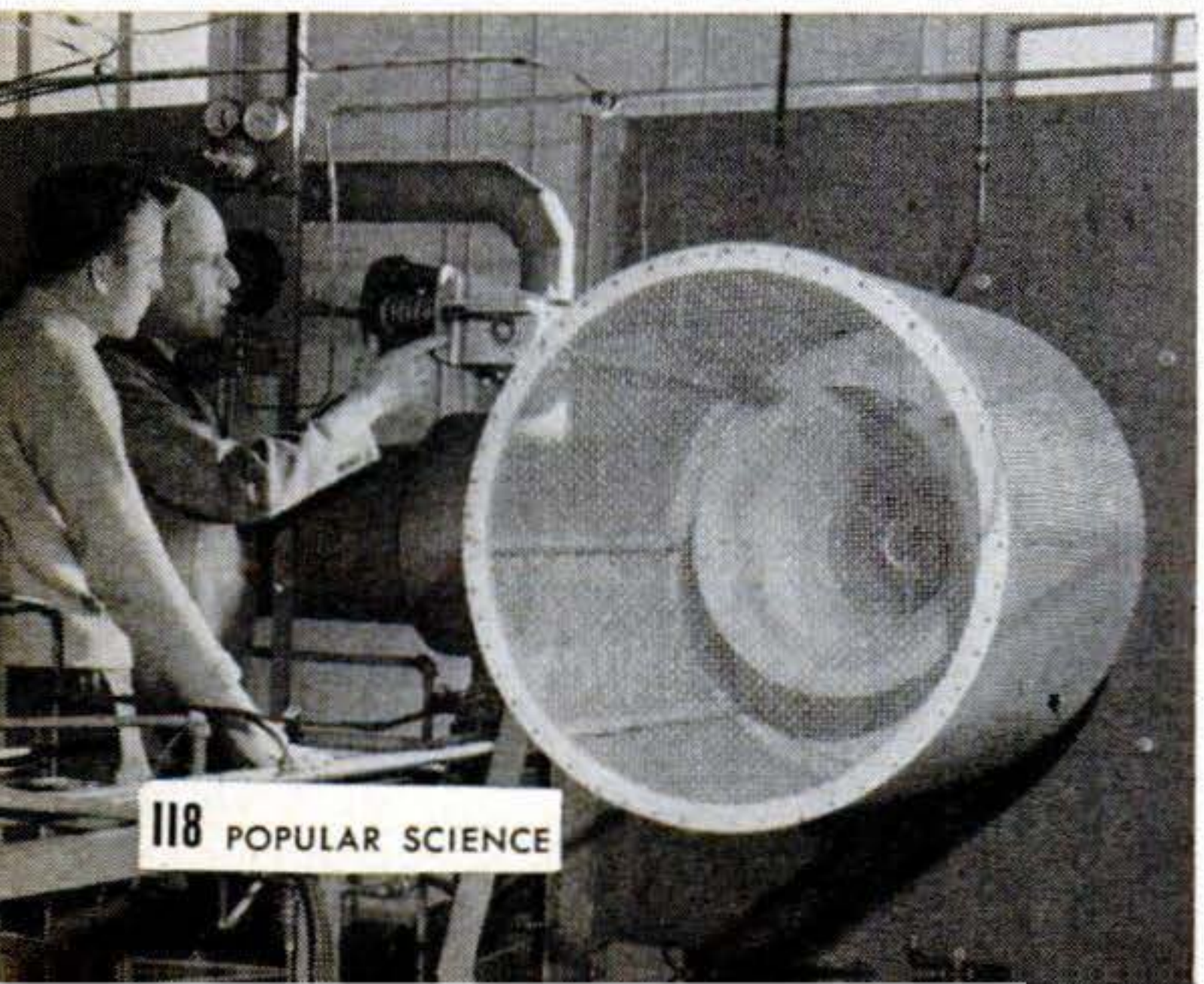
The equipment can also be used in the study of centrifugal compressor performance and air-flow measurement.

The turbosupercharger seen under arched protection guard is heart of the "educational gas turbine" at RPI. Above, Professor Neil P. Bailey is inspecting an instrument connection.

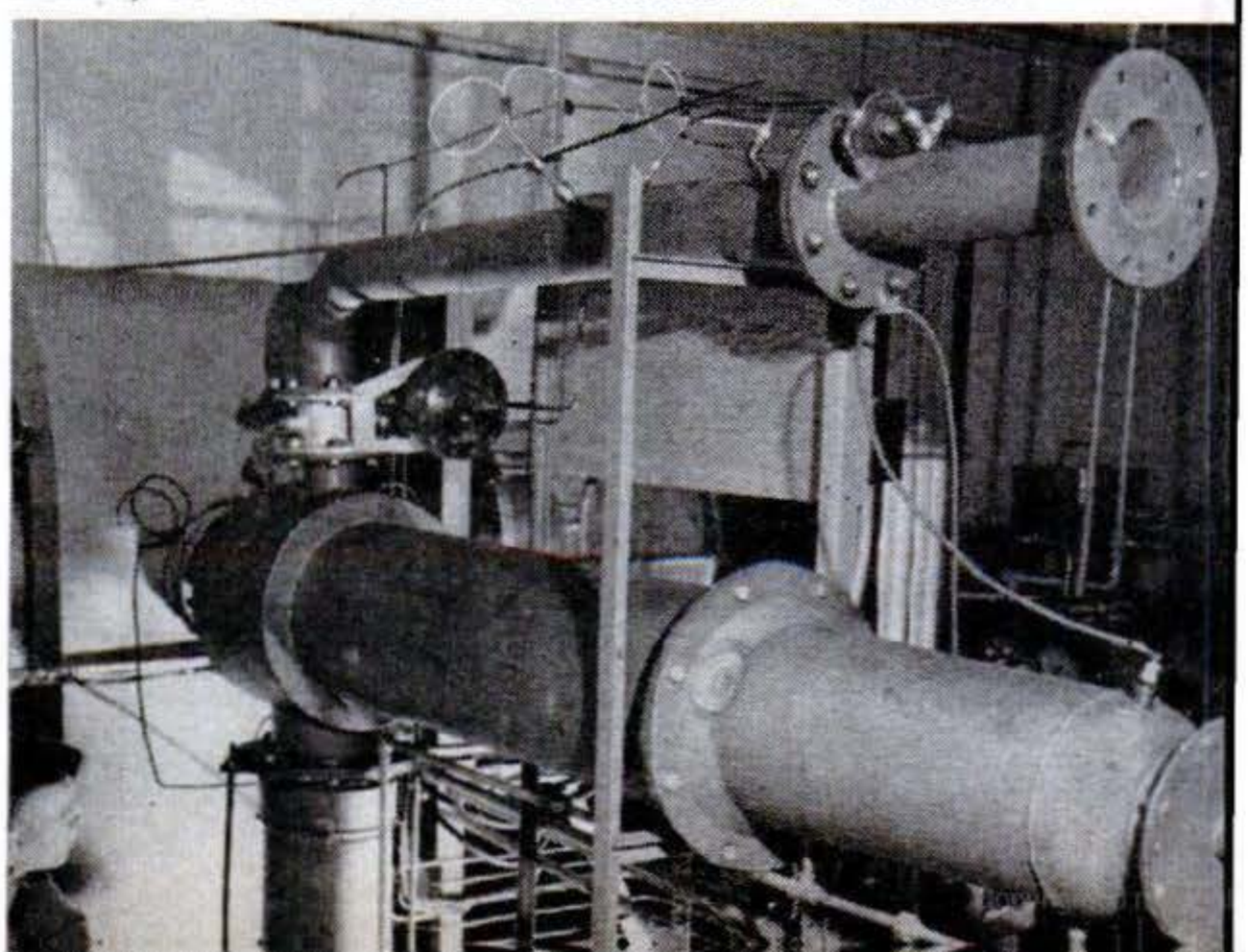


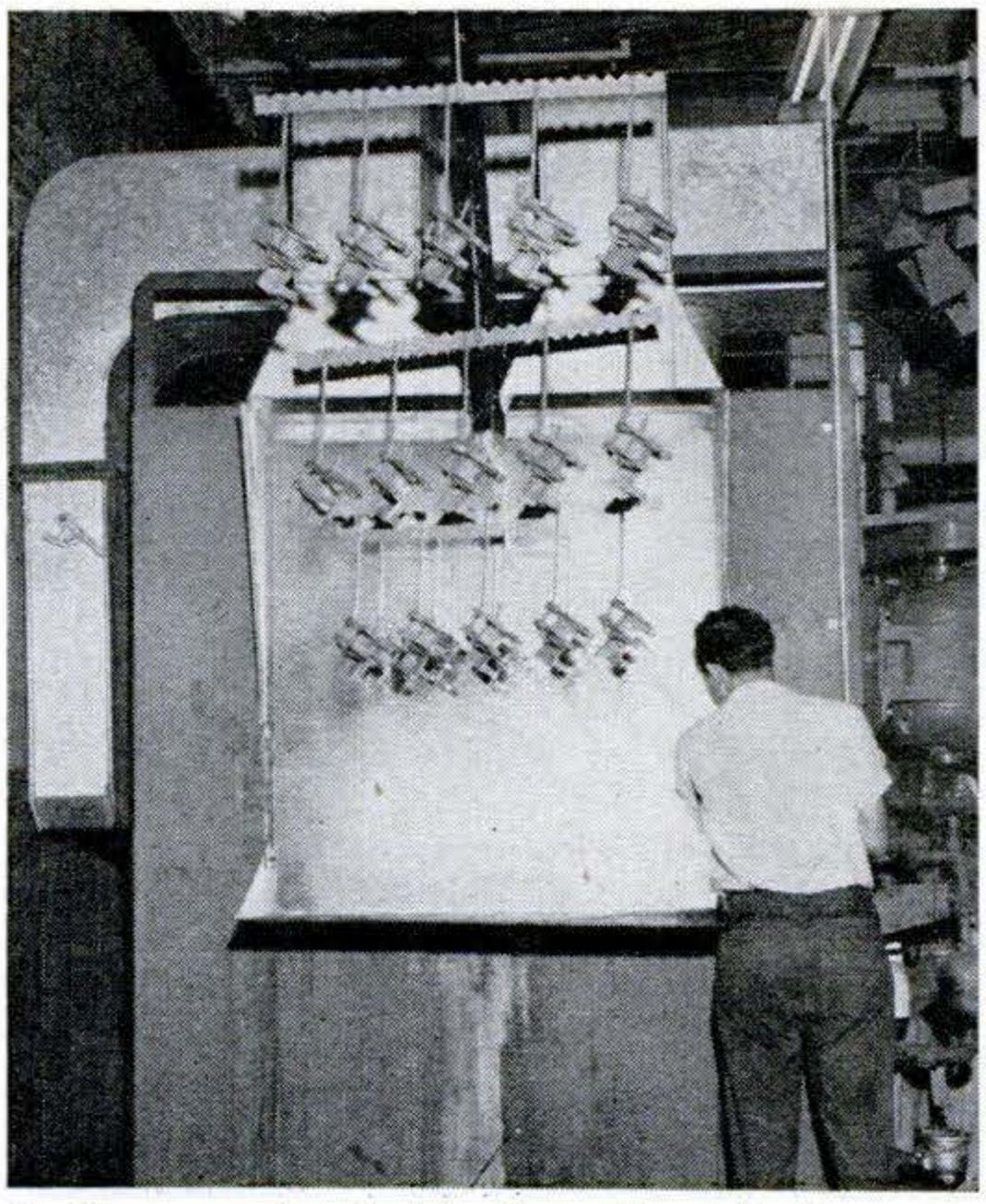
The gas-turbine equipment is installed in the laboratory of the school's Mechanical Engineering Department. Designers of the unit claim that it is the first educational project of its kind.

The operation of a jet power plant is explained to a Rensselaer student (below). In the foreground is the turbine's air inlet, covered with a wire screen to keep out dirt and dust.



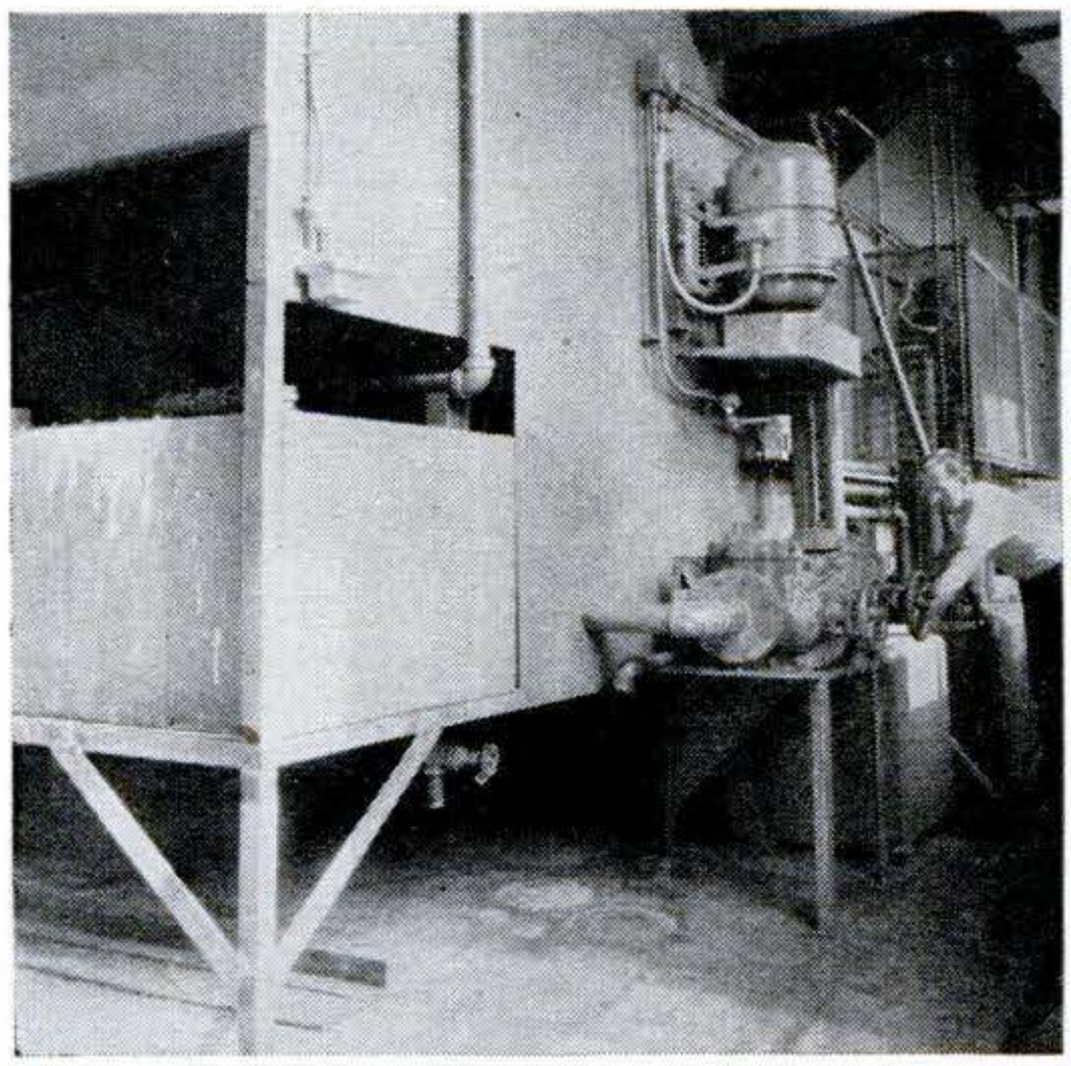
Students learn the fundamentals of gas-turbine operation by watching the unit go through its cycle. The long, horizontal pipe, at center below, is the machine's combustion chamber.



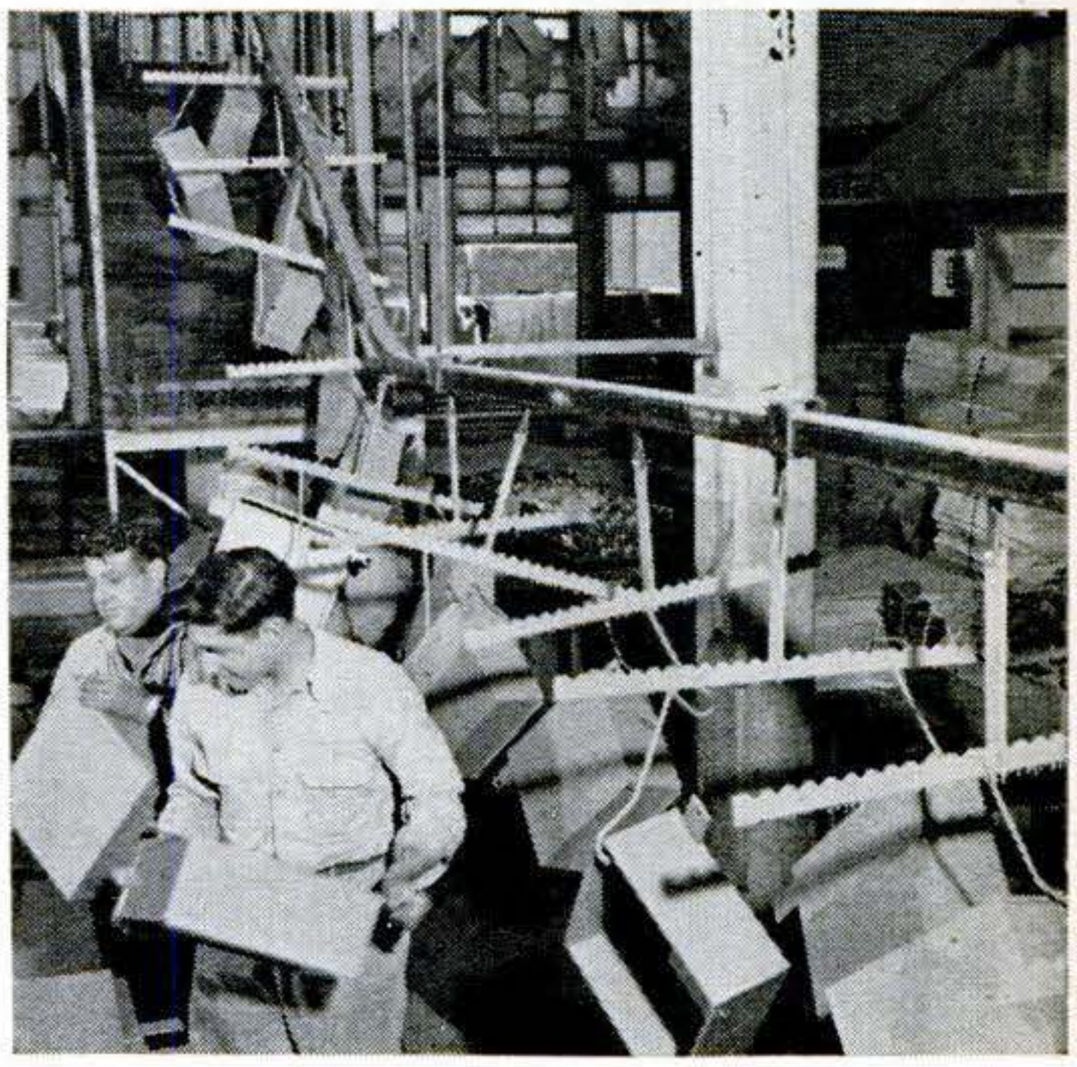


1. Parts to be finished go through the automatic painting machine on a traveling conveyer rack. Here they start the first step, entering a chemical bath that will clean them thoroughly.

3. Still-wet parts, now painted with an even coat of the right thickness, leave the drain tunnel for the electric baking ovens. A single piece is completely finished in less than two hours.



2. Inside this pressurized metal chamber, pieces are sprayed with paint. Then they move into a drain tunnel where excess drips off. Operator is adjusting thickness of paint being sprayed.



4. At the end of the line, human hands touch the parts for the first time since they entered the robot finisher. Cleaned, painted, and dried, the finished parts are now ready for assembly.

Robot Cleans, Paints, Dries

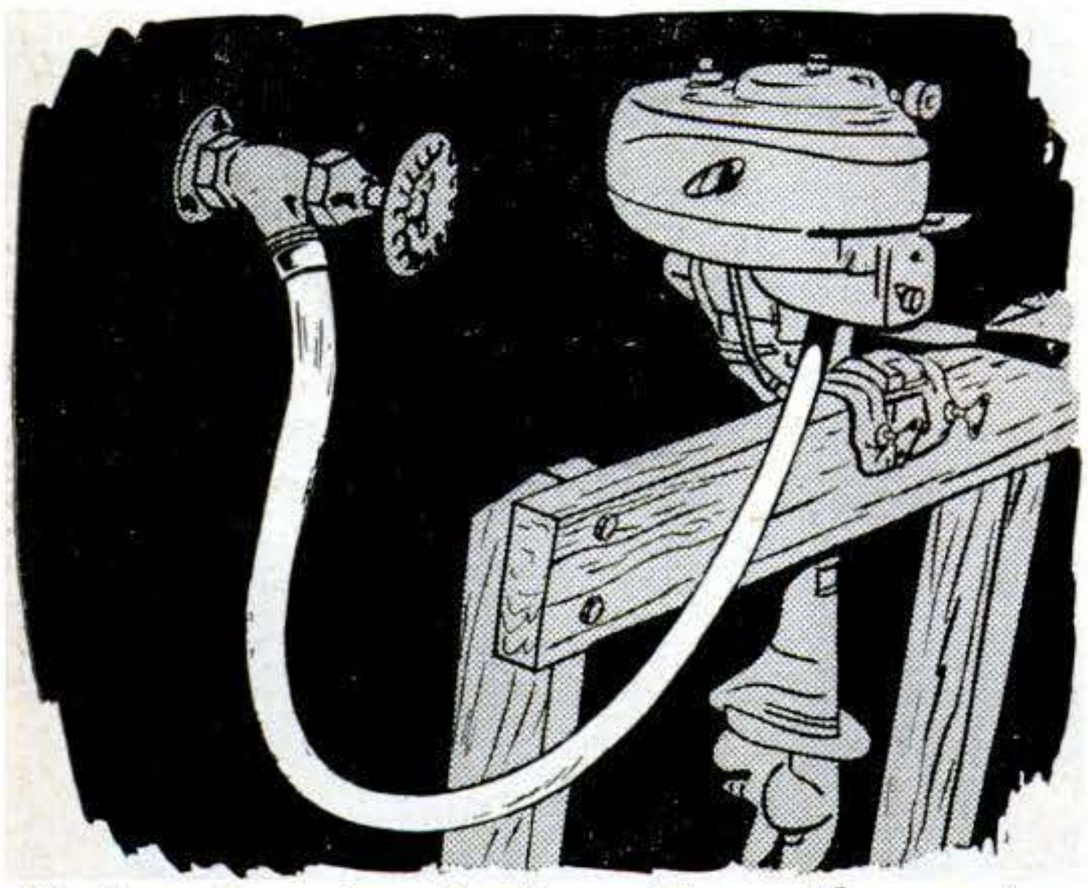
FEED an unpainted metal part into one end of this gigantic new GE machine and it will come out the other end completely finished. Now in operation at GE's control division at Schenectady, N. Y., the robot painter can handle 12,960 parts in an hour—cleaning, rustproofing, spraying, drying, and baking the pieces entirely by remote control. It even saves up the excess paint that drips off the parts and sends it back to the spray guns. Engineers spent two years designing the machine.

Copyrighted material

I'd like to see them make...

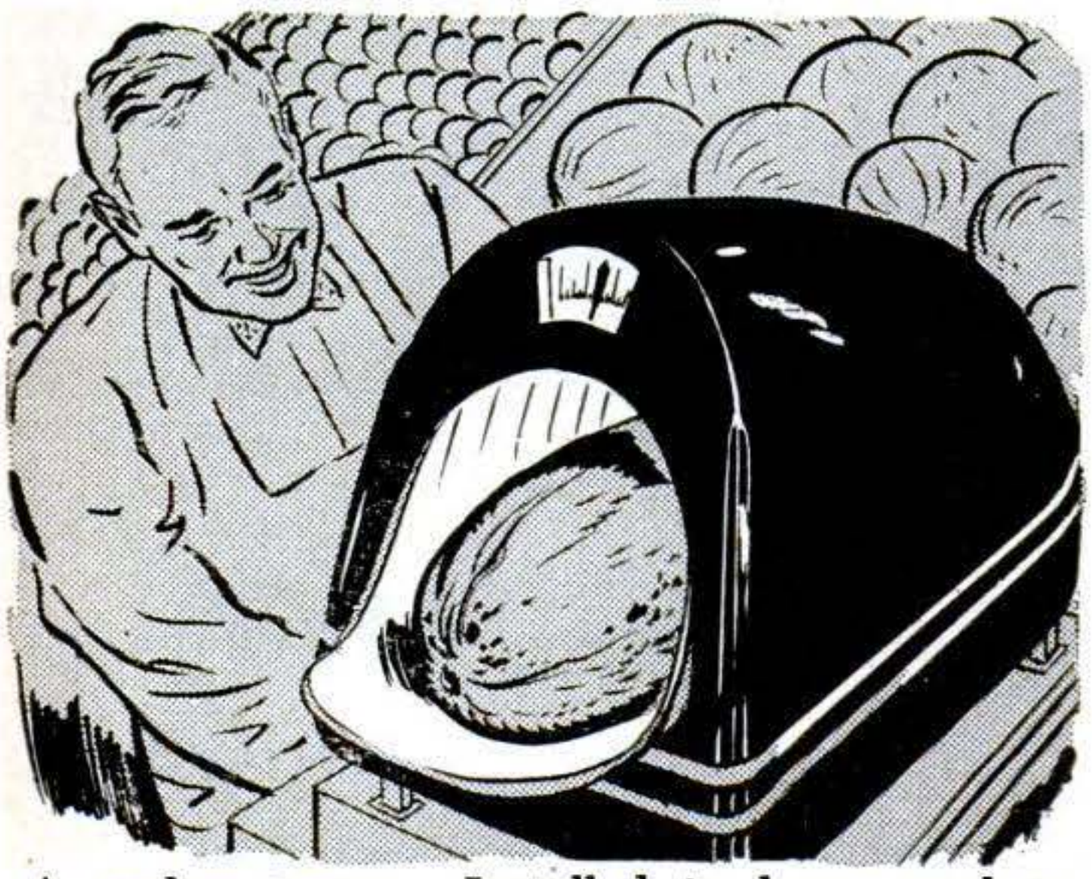
Everybody has his own pet idea of some gadget he would like to see in general use. What is YOURS? *Popular Science* will pay $5.00 for each one published. Use government postcards only. Contributions cannot be acknowledged or returned.

Built-in straws. Plastic straws inserted in soft drinks at the time of bottling would be more sanitary than boxed straws. They'd have to withstand long immersion, of course.—*William Zolchak, Yonkers, N. Y.*



Outboard-engine flusher. To avoid corrosion of cooling systems, outboards are run in a barrel of fresh water after salt-water use. A garden-hose fitting and valve would make flushing easy.—*H. C. Vickery, N. Wildwood, N. J.*

Disposable umbrellas. Made of waxed paper on a cardboard frame, cheap throw-away umbrellas could be sold from vending machines in lobbies, ball parks and subway exits.—*Daniel M. Davis, Library, Pa.*



A melon tester. Installed in large markets, this gadget could give a sonic or electronic thump to a melon, with a dial to register "ripe" or "unripe." No more guessing.—*Roy Wakamiya, Lancaster, Calif.*

A window wiper. The wiper mechanism could be built into the door by the driver. Keeping this side window clear would be an added safety factor. Power might be vacuum or electricity.—*Ernest Greeson, Jr., Brooklyn, N. Y.*

Copyrighted material

How New Jets Hit the Deck For U.S. Navy

Eight Furies salute the aircraft carrier *Boxer* during the U. S. Navy's jet-launching operation.

Successful landings and launchings on a carrier at sea initiate jets as a part of our ocean-borne air force.

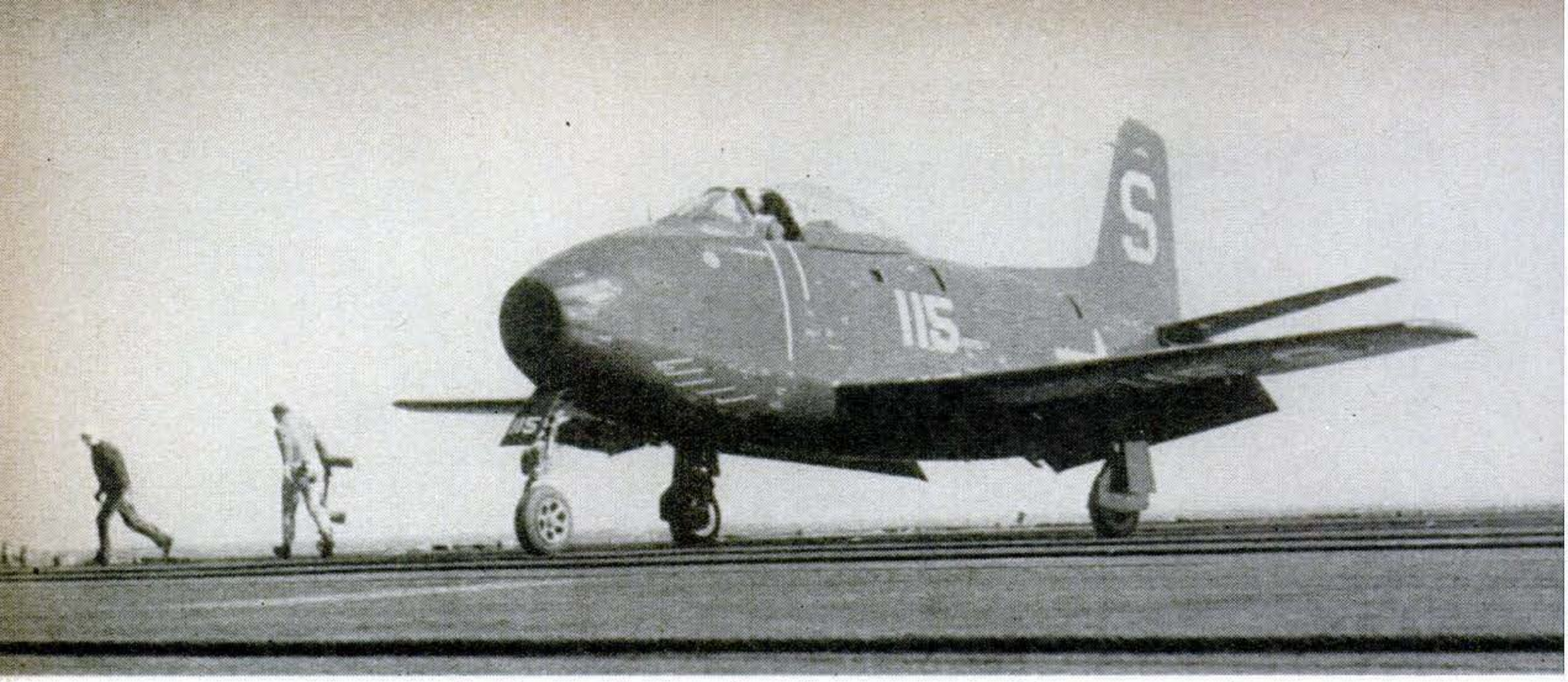
By Andrew R. Boone

FLASHING down over the fantail of the U. S. aircraft carrier *Boxer* one sunny day last March, a thick-bodied, thin-winged fighter hit the deck and slid to a stop in the grip of the arresting gear. A routine landing in all but one respect: the plane.

It was a shining new North American Fury—the first all-jet fighter ever to land on a carrier's deck under operational conditions at sea. Its arrival aboard the big Essex-class carrier off the California coast meant that years of Navy research and experiment had finally paid off in a new era of 10-mile-a-minute fighter sweeps for the fleet's air arm.

The historic landing was made by Comdr. Evan (Pete) Aurand, skipper of Fighting Squadron Five Able. Forty seconds later, Fighting Five's executive officer, Lt. Comdr. Robert Elder, followed Aurand in, setting his Fury down as soon as a squat deck tractor had tugged the lead plane beyond the crash barriers. For practical reasons, only these two of the squadron's planes landed in the initial test. But to make the trial complete, they took off under their own

Copyrighted material



Crewmen scurry away as the Fury, with Aurand at the controls, prepares for the first operational launching of a jet plane from a carrier deck. Six .50-cal. machine guns are mounted in the thin wings. With wing-tip tanks carrying an extra 300 gallons of kerosene added to 500 in fuselage tanks, the jet fighters will be able to stay aloft four hours and cover 1,500 miles.

Fighting Squadron Five's executive officer Elder (left) and Commander Aurand, who made historic jet-fighter landings on a carrier. Operation took place off the coast of California.

power and landed again, then took off a second time with the help of the catapult.

These and succeeding trial runs, which followed 200 landings on a make-believe carrier deck marked out on a California airfield, illustrated many of the factors that make seagoing jet operations a different business from propeller-powered flight.

As a striking force, a big carrier transports about 100 planes. Conventional fighters, taking off under their own power, can be launched every 15 seconds or so. Catapulting gets them off about a third as fast. In repeated tests, the Furies have shown that they can get aloft almost as quickly as propellered planes when deck-running, and about as fast when catapulted.

Jets don't accelerate rapidly at low speeds, so they need a longer run—the full length of the flight deck. Also, the roaring exhaust blasting back along the deck complicates the launching of several planes at a time, since it requires greater headway. Headway, which here means the distance (or time) between objects following one another along the same path, is a measure of effectiveness. It corresponds to the rate of fire of a machine gun.

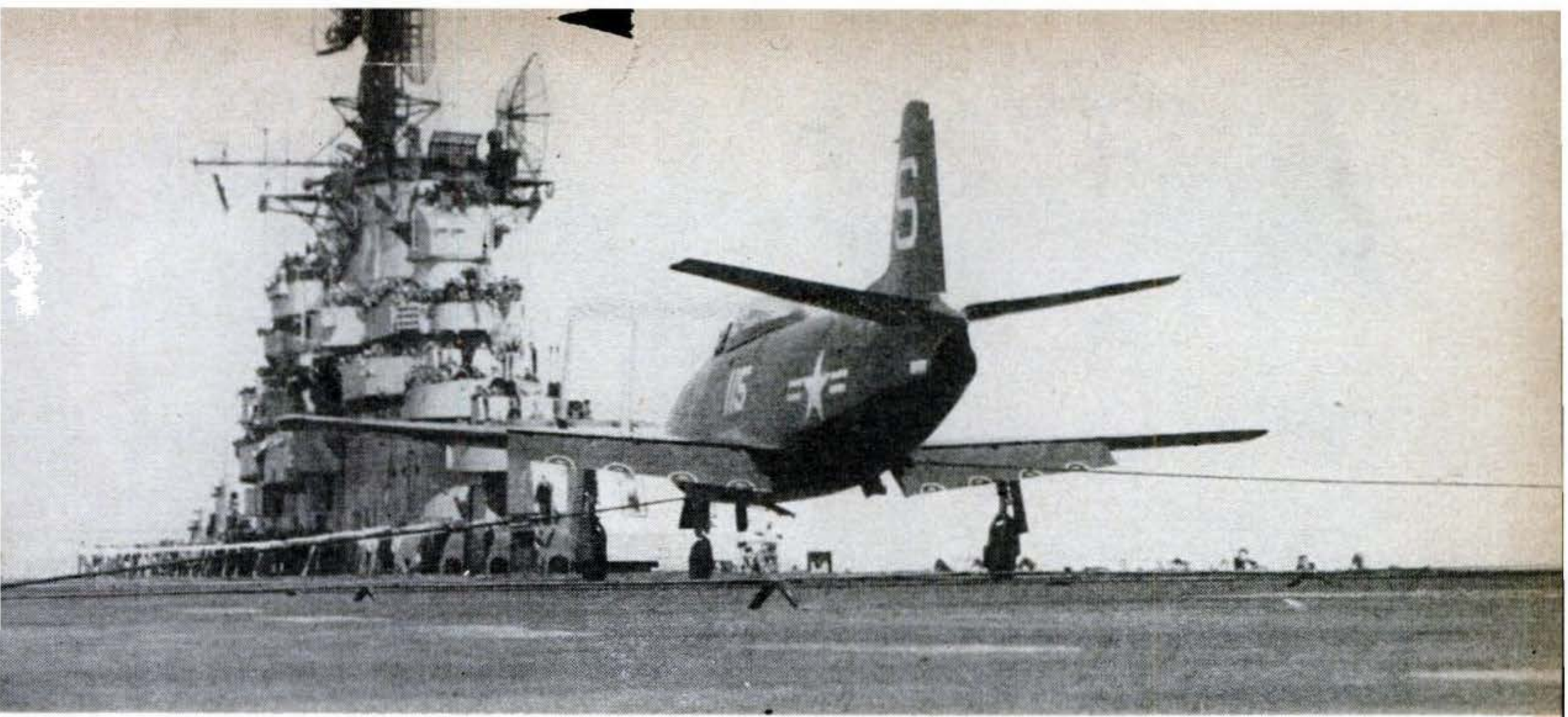
Jets have one tremendous advantage over reciprocating engines: they need no warm-up. At any alarm, a jet can be moved from a deckload of parked planes, started, and launched at once. The *Boxer's* Furies were clocked aloft less than two minutes after their engines were turned on.

All this means that a special system of catapulting will probably be evolved to shoot jets off, perhaps with a moving-chain pickup delivering them to the catapult stations. Two catapults, one on each side of the flight deck, could get a squadron of 18 planes into the air in six to eight minutes.

Jato rocket units could be used, but experienced pilots don't expect it. Jato drenches the deck with smoke. Sometimes rockets fail, ruling them out as an absolutely reliable launching aid. If generally used, large numbers of the Jato units would have to be stored aboard a carrier in space that is already precious.

The jet pilots prefer the catapult, modern versions of which provide a relatively

Copyrighted material



A dramatic moment in aviation history: Aurand's Fury becomes the first jet plane to make an operational landing on a carrier at sea. Note the first thwartship arresting wire bringing the 11,000-lb. fighter, moving at 115 m.p.h., to a dead stop after a roll of only 50 feet along the *Boxer's* deck. Meanwhile a destroyer waits astern, just in case the Fury "hits the drink."

smooth start. A jet plane zooms from zero to nearly 150 m.p.h. in a run of only 93 feet on the "cat," but acceleration is no more than 2.5 G—"less," as Aurand points out, "than we suffer in a tight turn."

Jet landings present new factors, too. Coming home to roost, the pilots fly a different approach pattern. In a Fury, with no big radial engine up front to obstruct his vision, a pilot can see exactly where he's going. For the first time, he can see the crash barriers raised amidships on the flight deck to stop his plane if it bounces over the 12 arresting cables, stretched across the deck at 25-foot intervals.

"Actually," Aurand told a POPULAR SCIENCE reporter, "it's a little frightening to watch those barriers come up." But both he and Elder agreed that landing a jet on a carrier was easier than setting down a conventional fighter.

For all the differences in jet landings and take-offs, most of the major problems concerning jet fighters have been solved. On the basis of the *Boxer* tests, the Navy feels that only practical details remain to be worked out, and a broad expansion of the jet program is already under way.

Fighting Five will be fully operational this summer. On the East Coast, Fighting Squadron Seventeen is getting set for sea duty with McDonnell FH-1 Phantoms. These squadrons will provide a nucleus of trained pilots and crewmen for other groups.

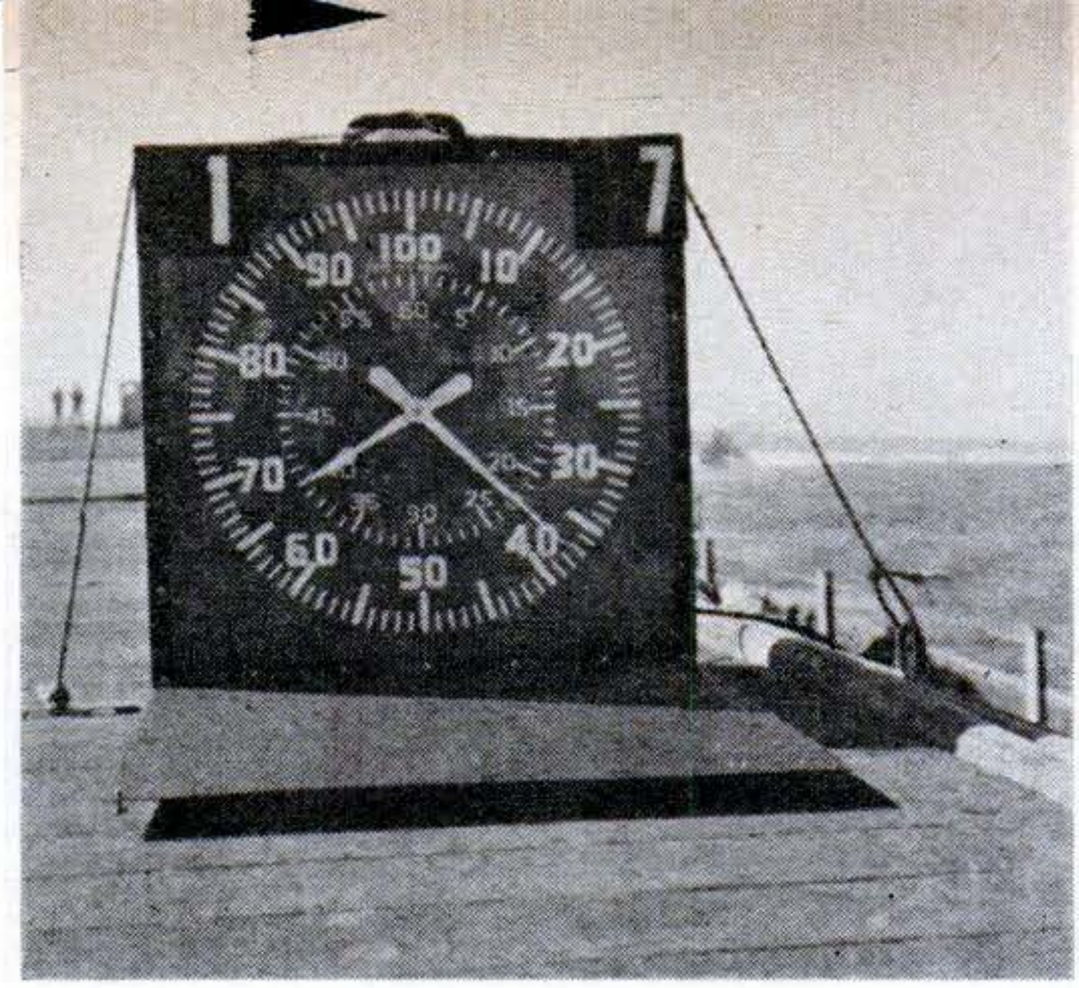
Both Furies and Phantoms are considered interim models (their successors may be the faster and longer-range McDonnell

Towed to aft elevator, plane shown above is lowered to hangar below deck. After refueling and servicing, it will be moved to forward elevator and raised to flight deck for catapulting.

Mechanic works to free landing hook. After each landing during the trials, the planes were thoroughly inspected and completely serviced. These jobs were done in a hangar below deck.

Copyrighted material

Immediately after the first landing, a small tractor pulls Aurand's plane up the deck beyond the crash barriers. Within half a minute, Elder sat his Fury down on the same spot.



Landing speed of each plane is photographically recorded as it hits the wire. A camera mounted at edge of deck catches both plane and the split-second clock face shown above.

The Fury gulps 72 cubic feet of air a second through this great gullet. Unlike that on some other jets, the intake is not split. The duct runs in a straight line from the nose to the tail.

Nose-wheel gear of Elder's plane is being checked by crewmen immediately after landing. Elder took a wave-off on an earlier approach to give his skipper the honor of the first landing.

F2H Banshee and the Grumman F9F Panther), but they provide examples of what jet propulsion means to the U. S. Fleet. The Fury, for instance, has a top speed of "more than" 550 m.p.h., and climbs to its fighting altitude faster than a mile a minute. At cruising speed, it can cover 1,500 miles during a four-hour flight; at top speed, it can stay aloft a few minutes short of an hour.

Fine for fighters, jet propulsion has one well-known limitation: it is least efficient at low altitude. And since many attack missions are flown "just off the deck," it is not yet practicable to use all-jet attack bombers. Therefore the Navy is limiting its initial jet program to fighters.

But the more versatile turboprop attack types may join the jet fighters, and eventually even the jets may be adapted to low-level operation. When that happens, the Navy's air arm can really cash in on the program begun by Fighting Five. END

Copyrighted material

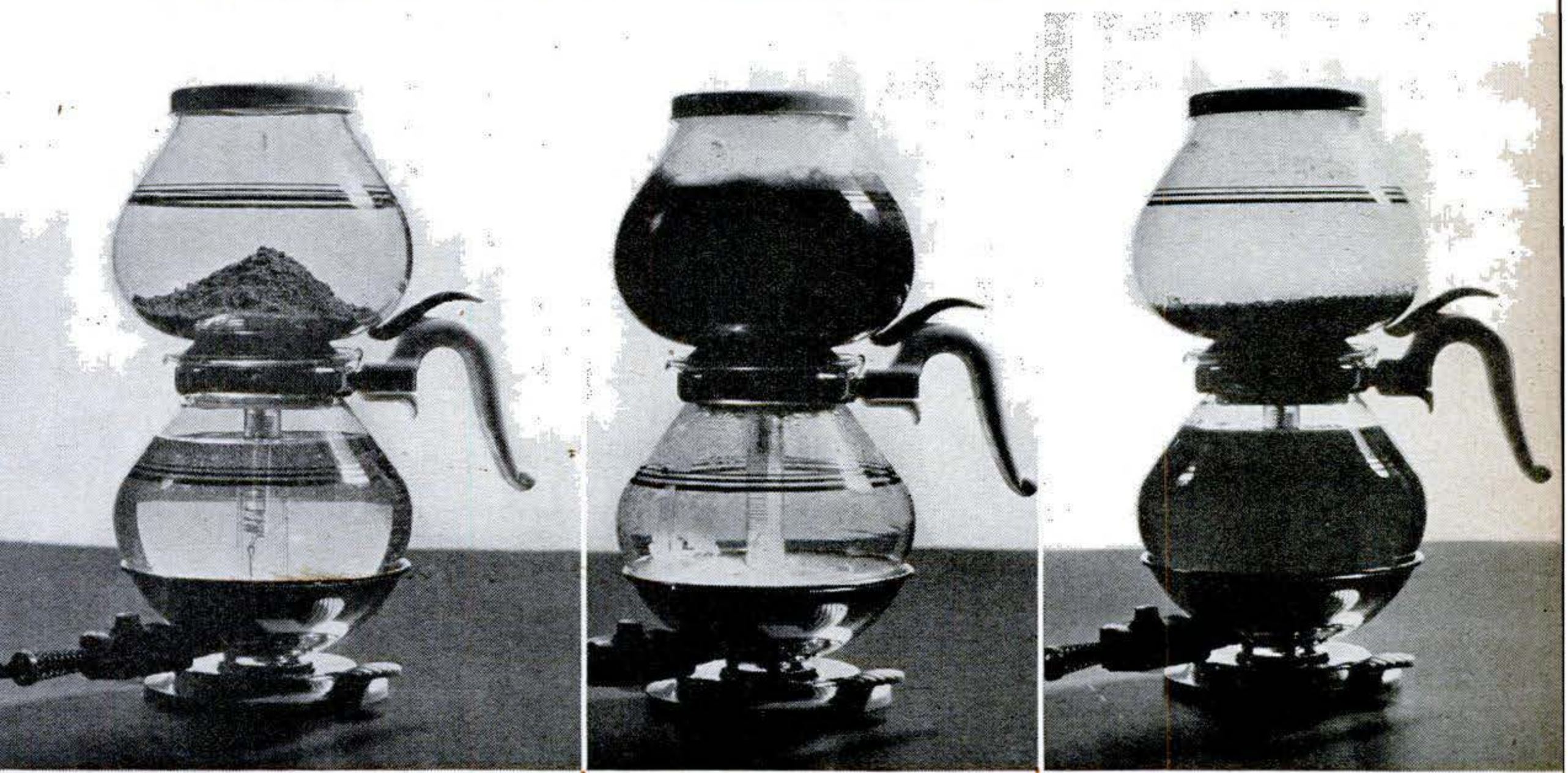
MECHANICS OF LIVING

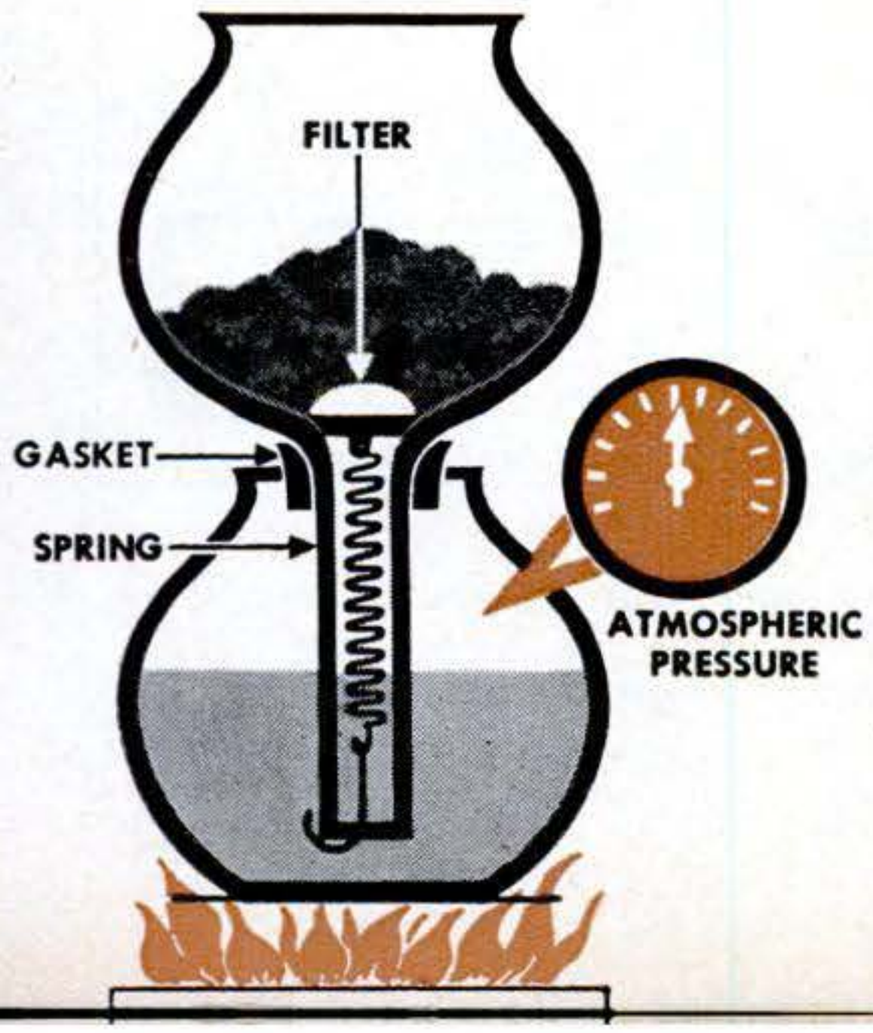
How a Vacuum Coffee Maker Works

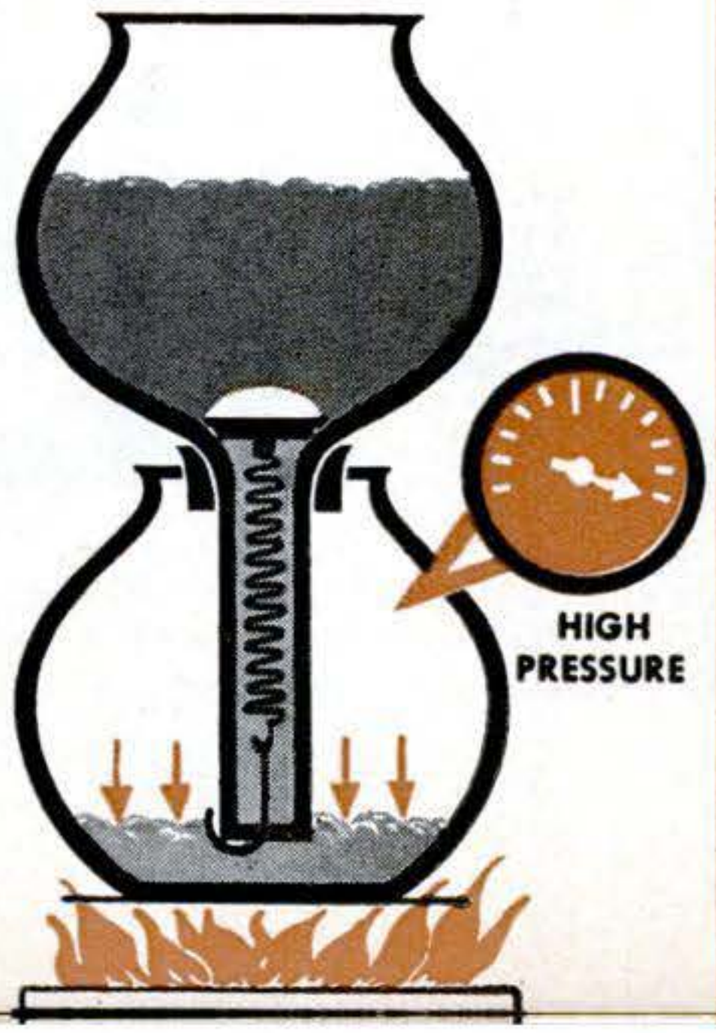
The ordinary vacuum coffee maker is really a very scientific gadget. Cleverly using changes in pressure exerted by water vapor to mix water and ground coffee, it then filters the liquid off—and makes good coffee, too. At first, air space above water in the pot is near atmospheric pressure.

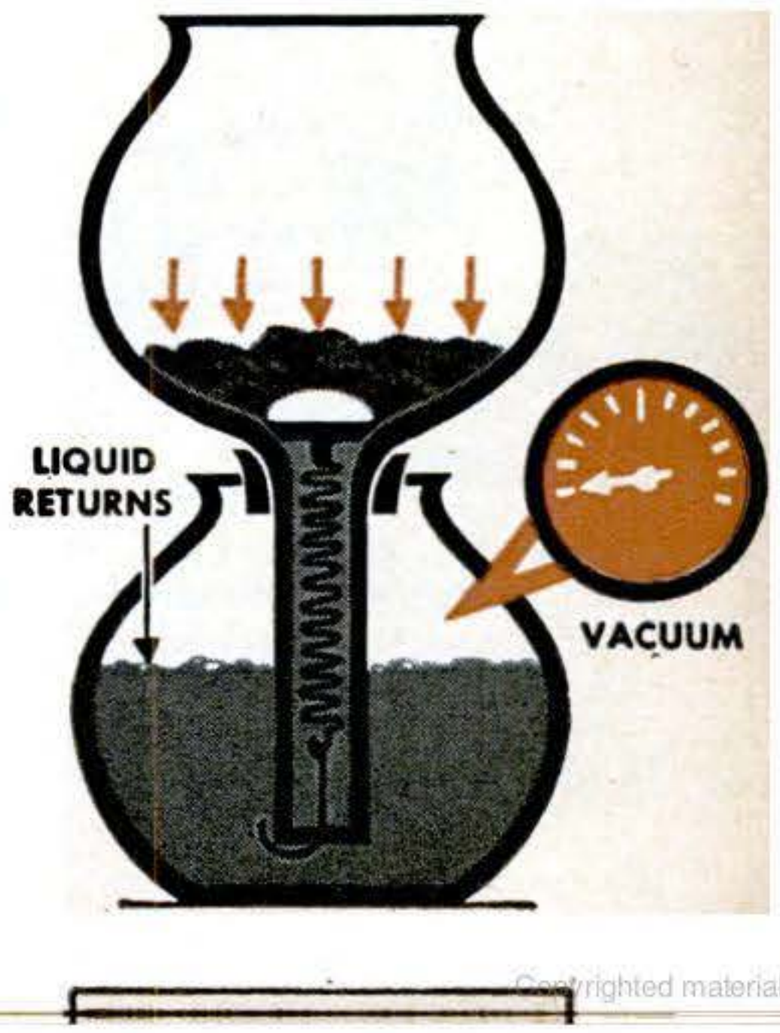
Heat converts some water into water vapor, or steam, which has no way to escape. Its pressure forces the water down and up the tube, through the cloth filter, and into the upper bowl. There it mixes with the ground coffee and is also stirred by bubbles of vapor coming up the glass tube.

When heat is removed, water vapor condenses, leaving pot practically empty—a vacuum. Air pressure then pushes liquid down through filter into pot. Filter lets liquid pass, but not grounds. Since some vacuum may remain, this Silex Ⓣ pot has small lever on handle to help remove upper bowl.







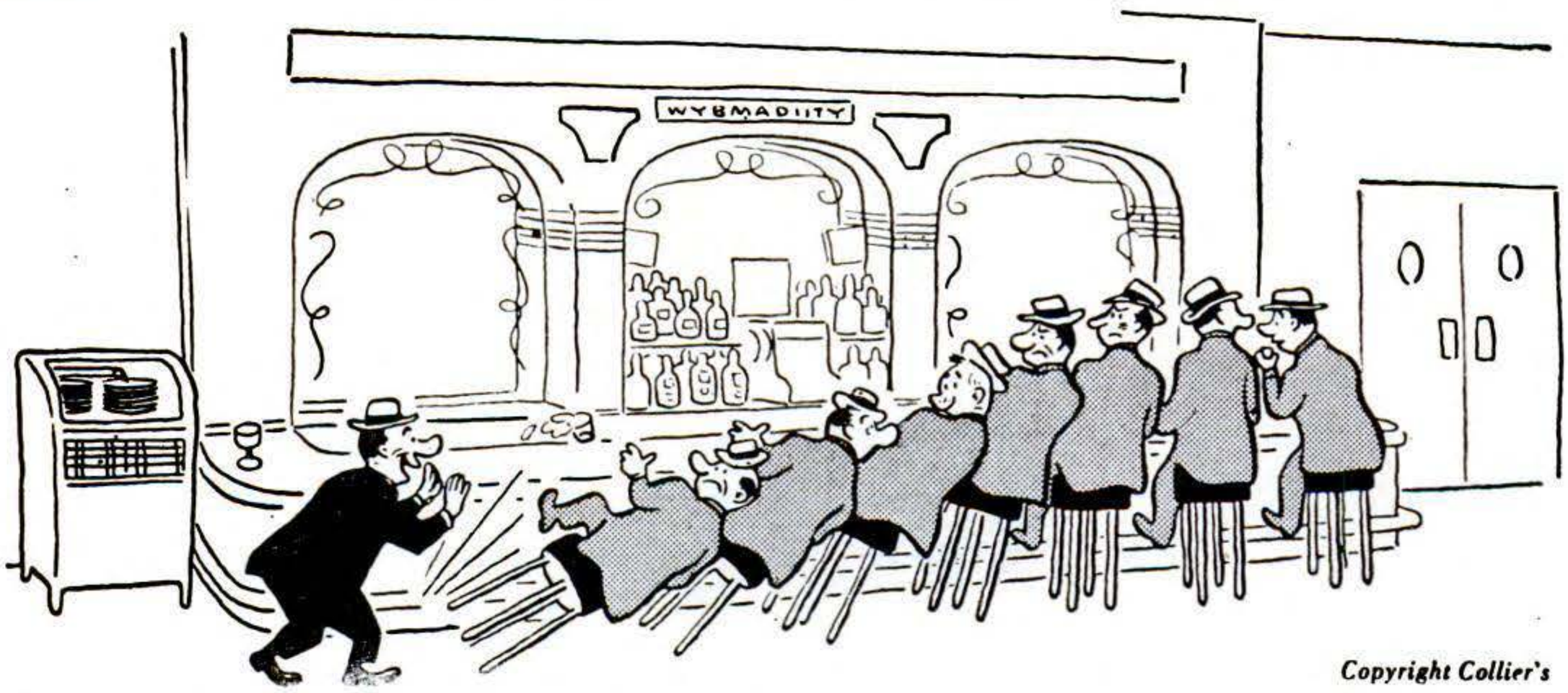


Copyrighted material

Cartoons Teach Physics with a Smile

A COLLECTION of more than 1,100 cartoons, clipped from newspapers and magazines over a period of years, enables Prof. Robert S. Shaw of the College of the City of New York to enliven his physics classes with apt and amusing illustrations. Often, his students find, a humorous analogy offers welcome aid to grasping a point in mechanics, optics, acoustics, or electronics.

Lantern slides made from his favorite cartoons conclude class periods. For reference, others are grouped by the points they illustrate in scrapbooks, covering with remarkable completeness such subjects as "Statics," "Heat and Sound," and "Molecular and Atomic Physics." Five examples are reproduced here, through the courtesy and by special permission of the copyright owners.



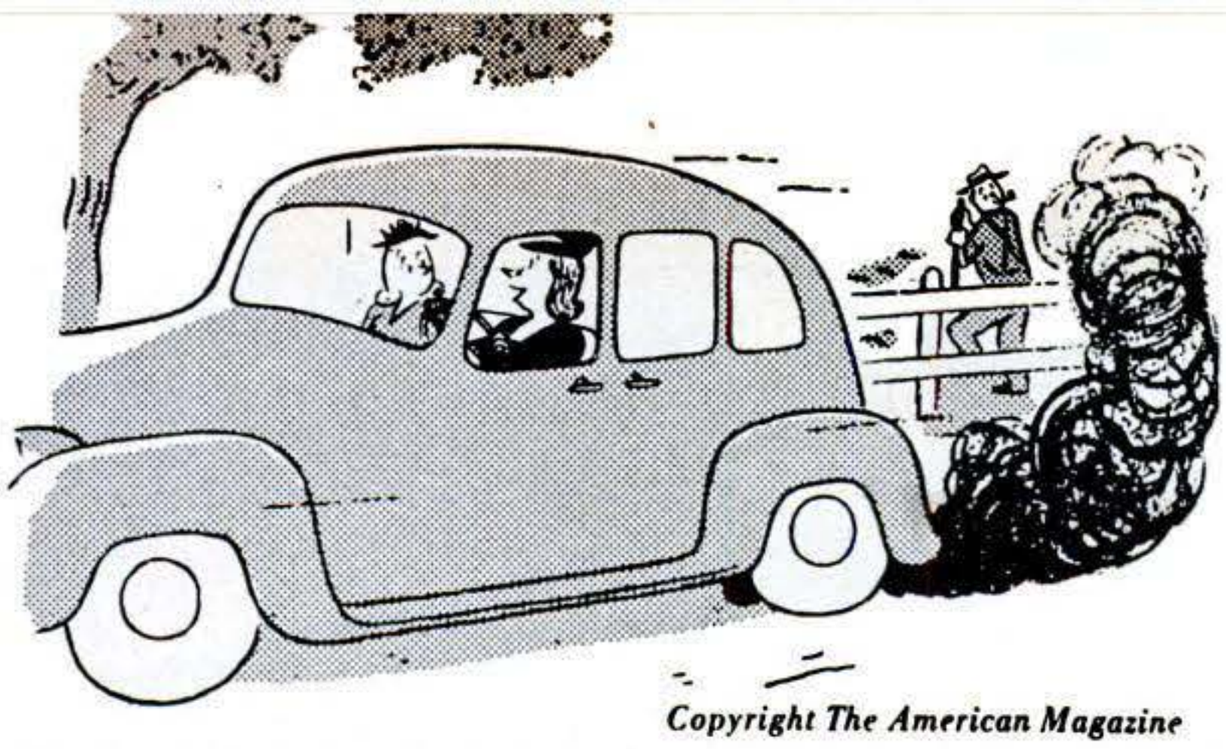
Copyright Collier's

Propagation of a wave is illustrated by Prof. Shaw, for students of mechanics and hydrodynamics, with this humorous analogy from his cartoon collection. Artist Colin Allen's original caption had the prankster saying, "I've always wanted to try this"—a commendable predilection, if indulged under more appropriate circumstances, for the experimental method.

The theory of isostasy, dealing with the tendency of equally massive blocks of the earth's crust to seek a common level, gets an assist with this clipping from the newspaper "funnies."

Cartoonist Ernie Bushmiller might be astonished to find his popular comic strip "Nancy" serving at the College of the City of New York to point up an abstruse principle in geology.

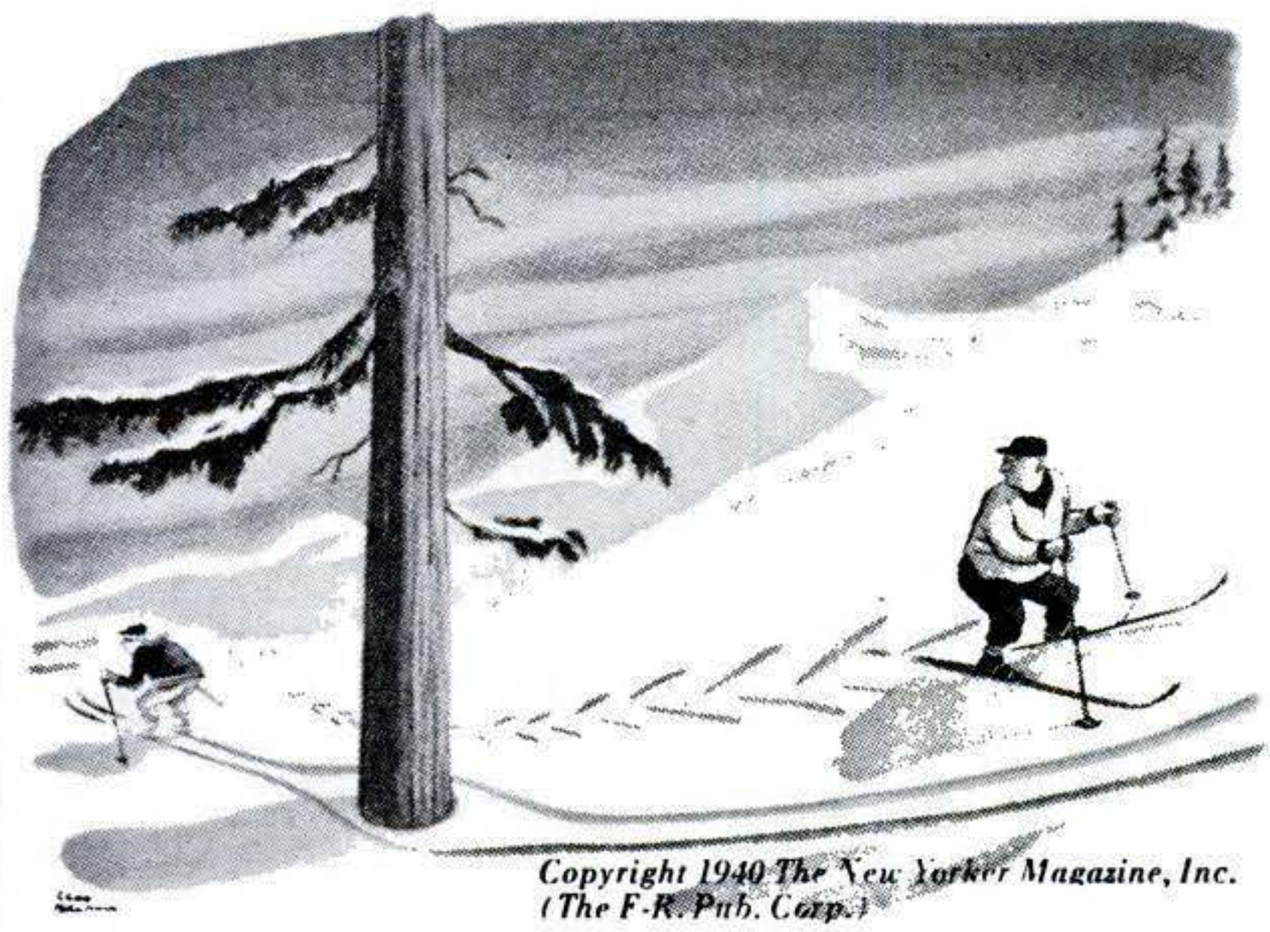
Copyrighted material



Copyright The American Magazine

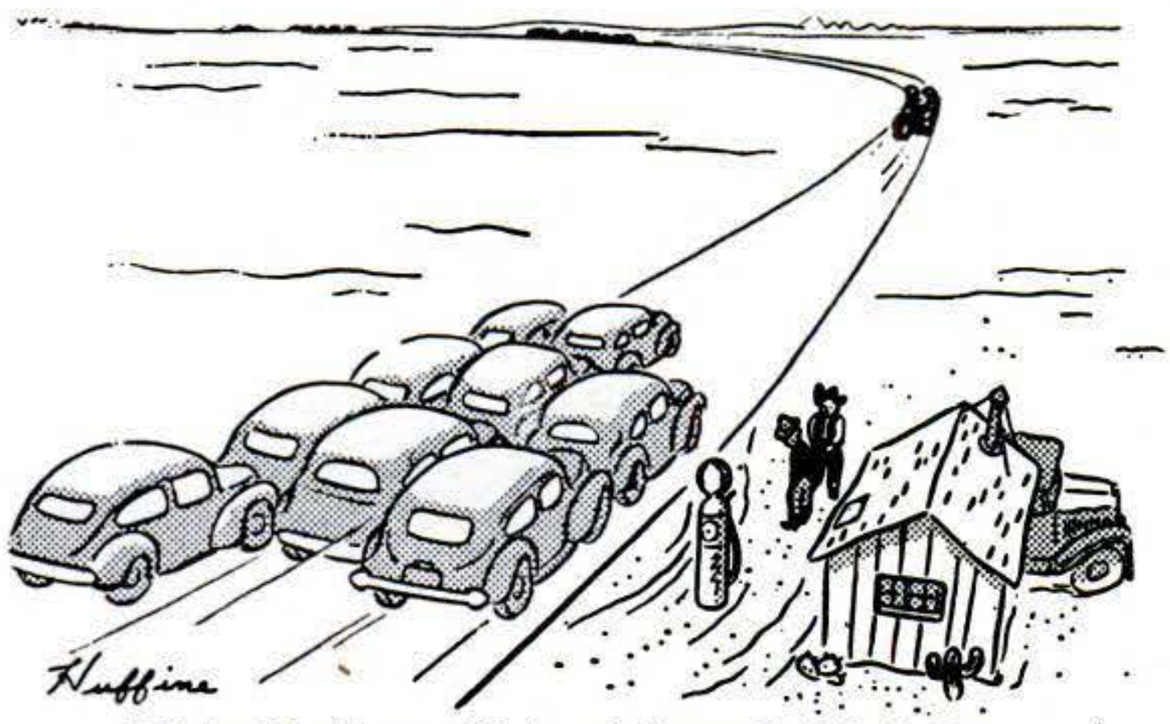
"I always keep the emergency brake on just in case of emergency"

Friction converts mechanical energy into heat —as lady motorist, whose concern for safe driving exceeds her comprehension of machinery, unwittingly demonstrates in Stan Hunt cartoon.



Copyright 1940 The New Yorker Magazine, Inc. (The F-R. Pub. Corp.)

But for the forces between the remote atoms of matter, one solid object could readily pass through another, and the fantasy of Charles Addams' captionless drawing could be fact.



"It's the 35-mile speed limit and that traffic light in Tucson

Copyright Collier's DAVID R. HUFFINE

Radar's klystron tube uses principle vividly illustrated by this cartoon. Cars traveling in clusters correspond to speeding electrons, similarly grouped or "bunched" in vacuum tube.

Photo by Western Ways

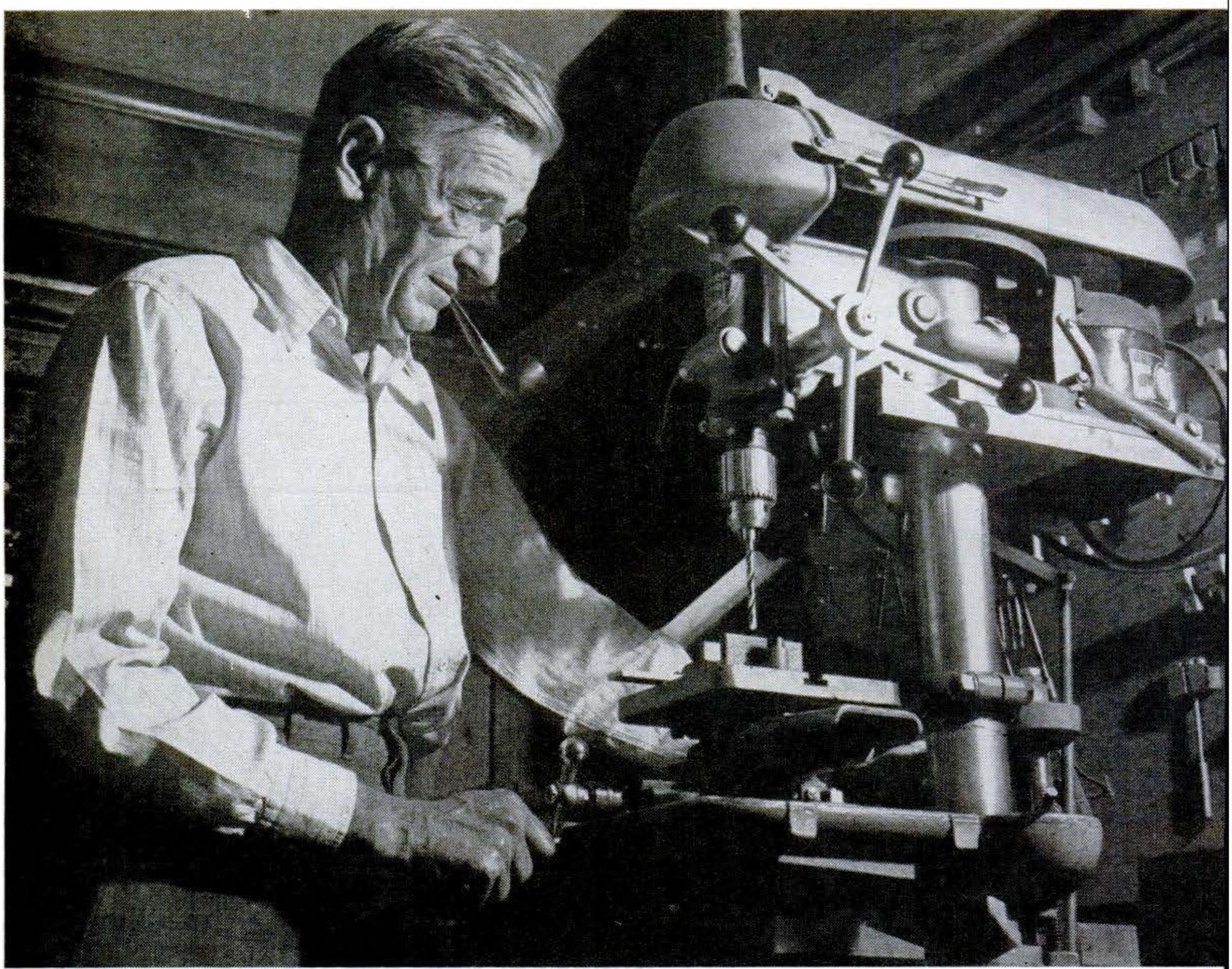
Cable-Eating Gophers Foiled at Last

TO THE gopher perched on this cutaway section, an A. T. & T. coaxial cable is an appetizing meal—even though it is buried six feet deep and has an exterior sheath of lead, phenolic and jute wrapping, and steel and copper tape covering the conductors.

Almost as soon as brand-new cables for transcontinental phone calls were laid west of the Mississippi, where gopher land begins, the burrowing rodents began disrupting service with short circuits and crossed lines. They gnawed right through all the layers.

Experimenters then offered captive gophers a diet of cable sections packed in earth-filled cans. Inner wrappings of .005-inch and .007-inch copper tape failed to stop them. Finally, .010-inch copper tape proved too much for all but one extra-sharp-toothed gopher. The scientists settled for that, and today this tape stops all but the most determined gophers from cutting in on your call.

Copyrighted material



Like many other noted scientists, Dr. Vannevar Bush, head of the Army-Navy-Air Force Research Board and president of Carnegie Institution, is an accomplished craftsman at home.

Top Scientist Has Own Shop

Vannevar Bush relaxes from running the Carnegie Institution by running power tools in his own basement.

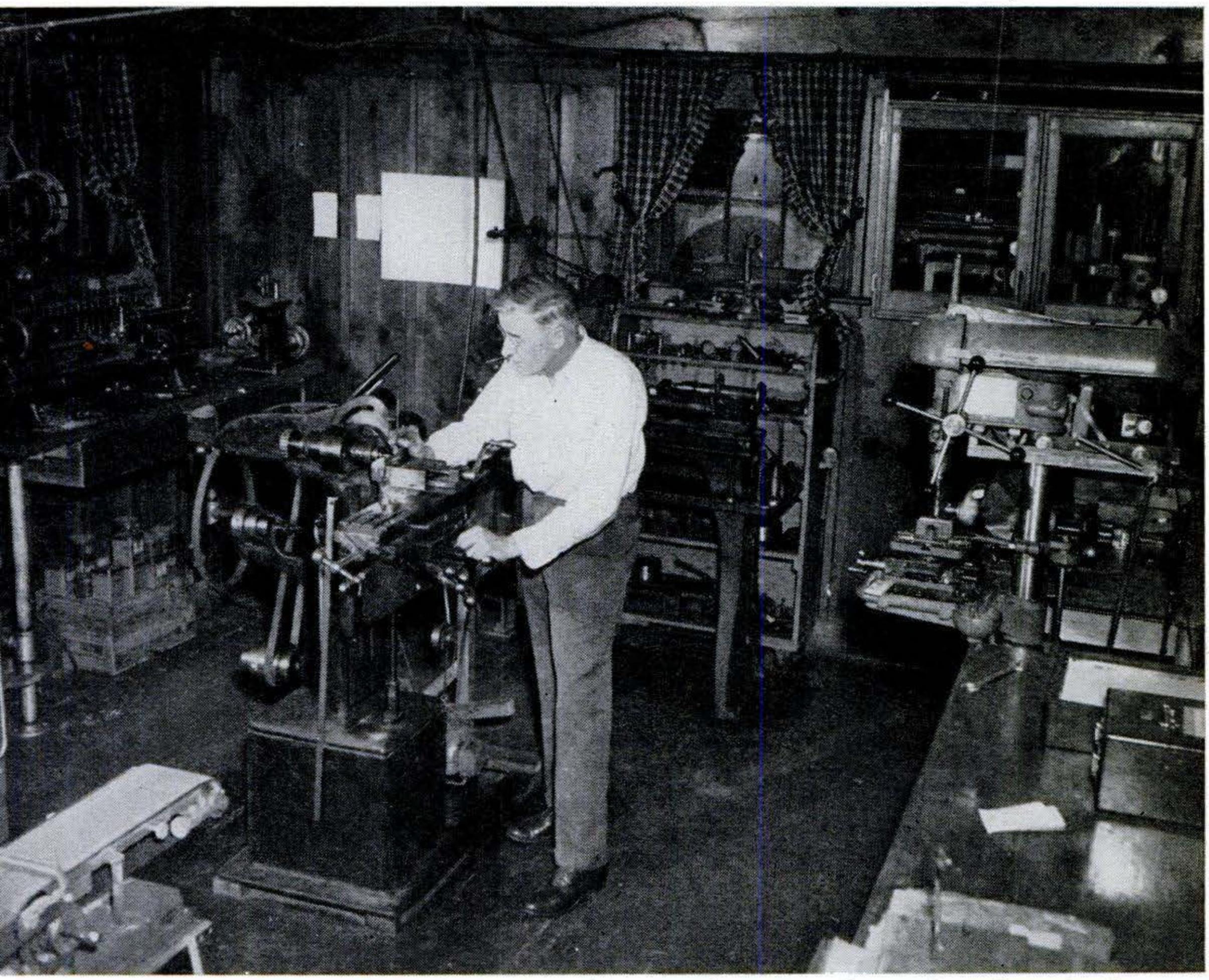
By John F. Loosbrock

A BRILLIANT scientist uses his hands to get his facts and prove his theories, just as a skilled artisan uses his head to get the most from his hands and machines. Vannevar Bush is one of the top-ranking scientists in the country—president of the Carnegie Institution, wartime director of U. S. research, holder of an impressive string of degrees, medals, and patents. He is also a top-ranking craftsman, living proof of the kinship between science and workmanship.

A veteran of 45 years of home craftsmanship, Dr. Bush has spent 30 of those years collecting the formidable array of power tools that crams a 14 by 20 room in the basement of his Washington home. And he spends every spare moment there.

The war, during which Dr. Bush ran the Office of Scientific Research and Development, put a crimp in his home life and he stored his tools and equipment for the

Copyrighted material



In the well-equipped basement shop of his home in Washington, Dr. Bush specializes in making unusual scientific gadgets that have not been made before, at least in home workshops.

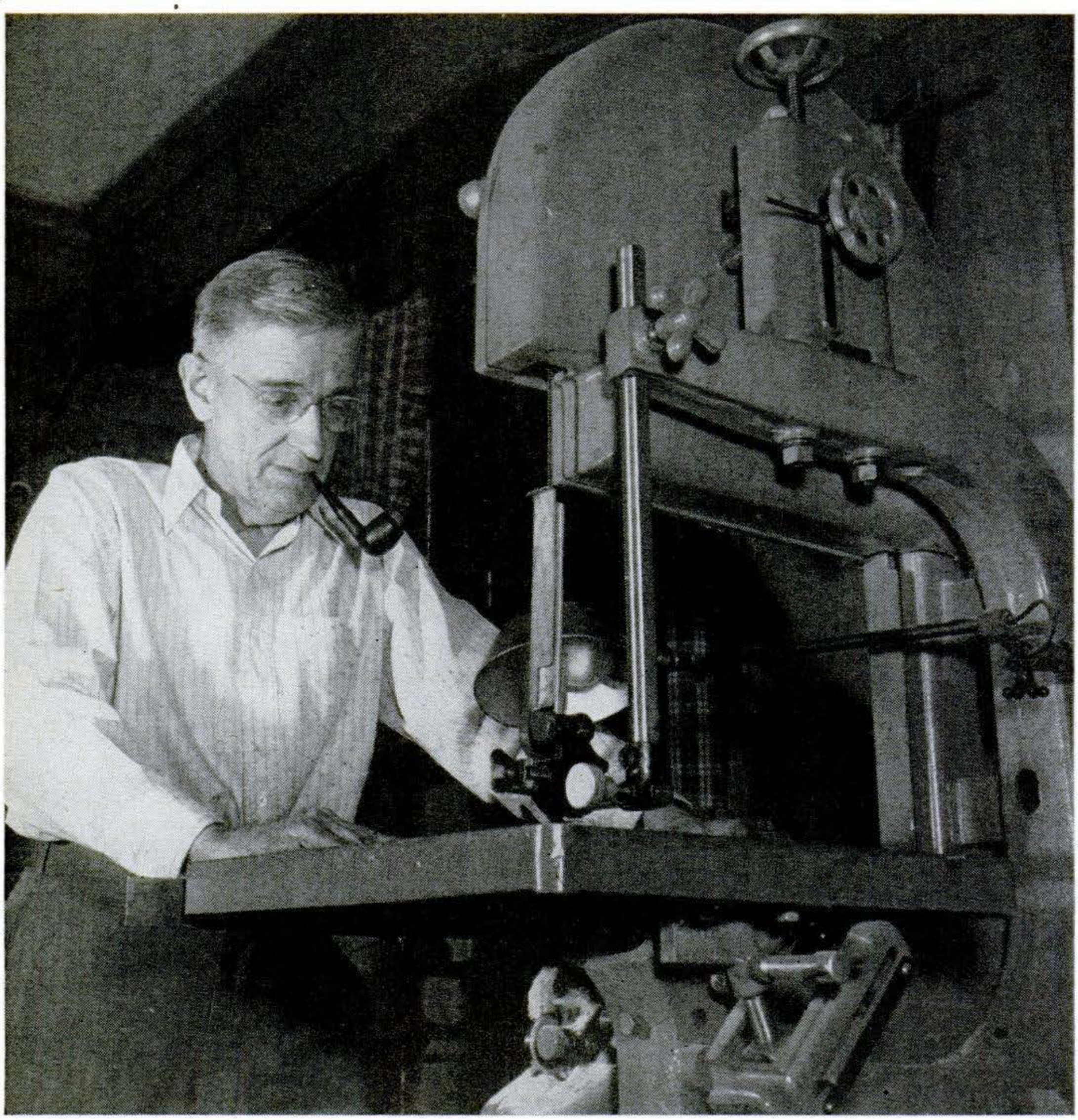
duration. After VJ-day he dusted them off again, but with the scientist's eye for precision he spent the weekends and odd moments of almost two years in arranging his shop, installing built-in cabinets for attachments and gadgets, before he did much actual work.

Compared to the average home workman, Dr. Bush's output is small, partly because he lacks leisure and partly because of the difficult tasks he sets for himself. He has two criteria for his projects: preferably, they are some precise scientific gadget that no one has ever made before, at least at home; or they are made in a unique way. For example, his biggest postwar project has been the production of a set of optical flats—three Pyrex ® glass disks, six inches in diameter and three-quarters of an inch thick, ground and polished to a precise flatness varying no more than one-tenth of a wave length of red light, or two-millionths of an inch. You don't turn those out in one evening!

A typical Bush touch in the workshop is a set of sliding plywood panels, or false walls, hung on overhead tracks along one wall. The panels contain the attachments for the various machines, such as the drill press, milling machine, and band saw. The proper panel can be shifted on the tracks to be near the particular machine he is using. Dr. Bush has altered much of the machinery to fit his own needs. Most of the changes either give a greater range of speeds or make it more convenient to shift from one speed to another.

Besides being a top government scientist and administrator, Dr. Bush is an inventor of no mean stature. His inventive interests have for years been focused on harnessing mechanical and electronic means to do more

Copyrighted material



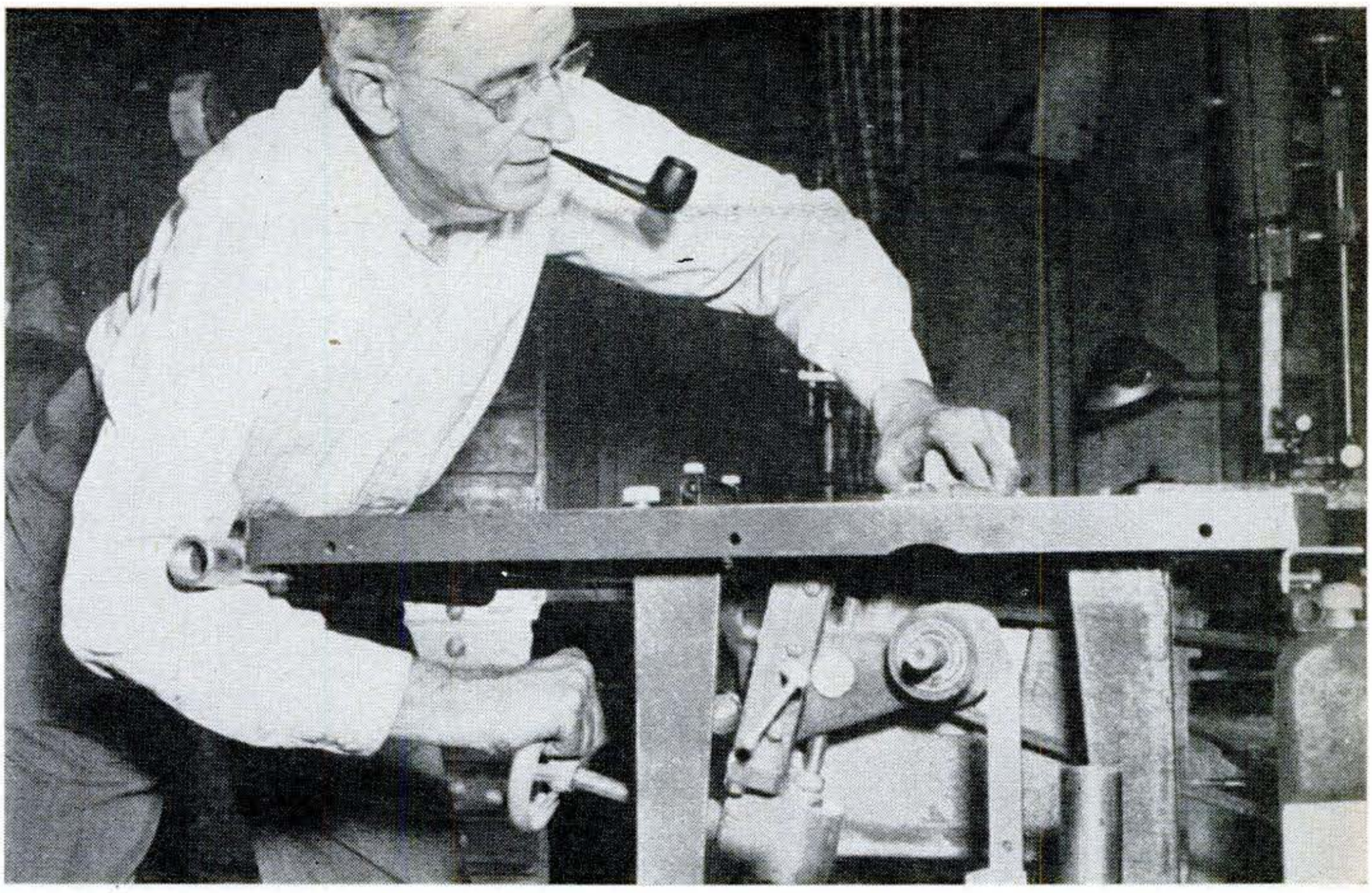
Wartime duties as director of the famed Office of Scientific Research and Development kept Dr. Bush so busy that he only recently returned to his hobby machines, such as this bandsaw.

and more of man's computation, calculation, and repetitive routine for him, leaving more time for just plain thinking.

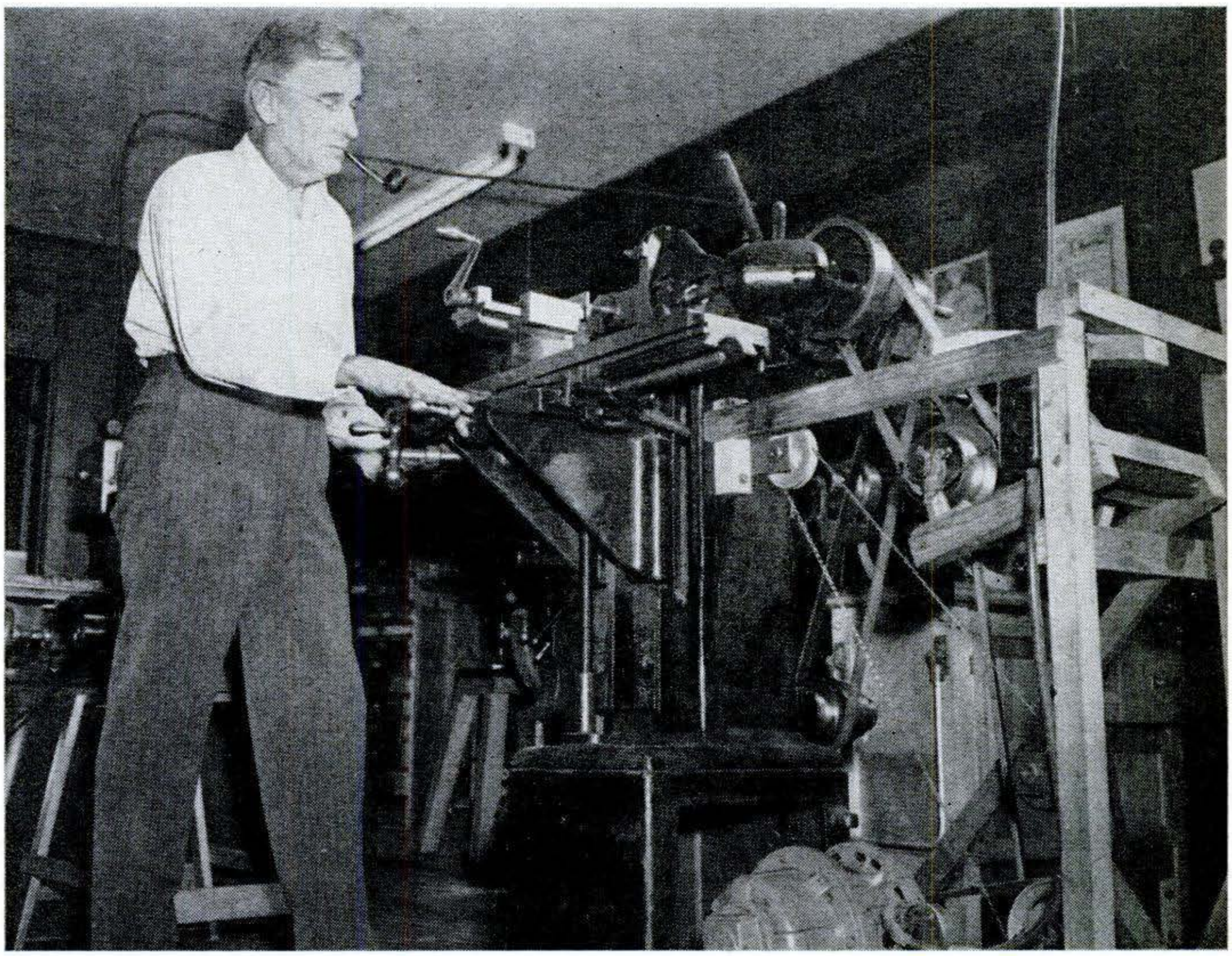
For example, at Massachusetts Institute of Technology in the late 1920's Dr. Bush developed a network analyzer, which set up in miniature a large electrical power system so that its performance could be tested under stress. Another product of his interest in tools to free man's intelligence for creative effort is the differential analyzer. One was begun at MIT under his direction in 1935. Ten years later it was made public after working on war problems for some three years. The machine weighs 100 tons, combines some 2,000 electronic tubes, several thousand relays, about 150 motors, and nearly 200 miles of wire. It solves differential equations expressing mathematical problems with as many as 18 variables.

Other Bush devices include the rapid selector, which scans and selects wanted items from microfilm, and a justifying typewriter, which produces typescript with an even right-hand margin in a single operation. Another idea, which has not progressed beyond the fanciful and speculative stage, is a sort of a mechanical memory (Dr. Bush calls it the "memex") that would flash on a screen all the data a person has collected on any subject at the push of a button. END

Copyrighted material



Dr. Bush is seldom satisfied with his machine tools as they come from the factory, and generally alters them to give more precise, simpler adjustments and a greater range of speeds.



An example of the Bush-made attachments is the power take-off arrangement (the belts and pulleys on the wooden frame at right, above) he has added to this standard milling machine.

Copyrighted material

Records are preselected by adjusting into one of four positions the lever beneath each of 100 records in the library. First position plays "A" side of record, second "B" side, third both sides. Fourth position lets pickup skip record and move on to next. At bottom of cabinet, left to right, are controls of power amplifier, dual-line outlet to distant speakers, and AM-FM radio. All but record selection can be run by remote control. Cabinet is 52" x 37½" x 27½".

How New Phonograph Runs Itself All Day

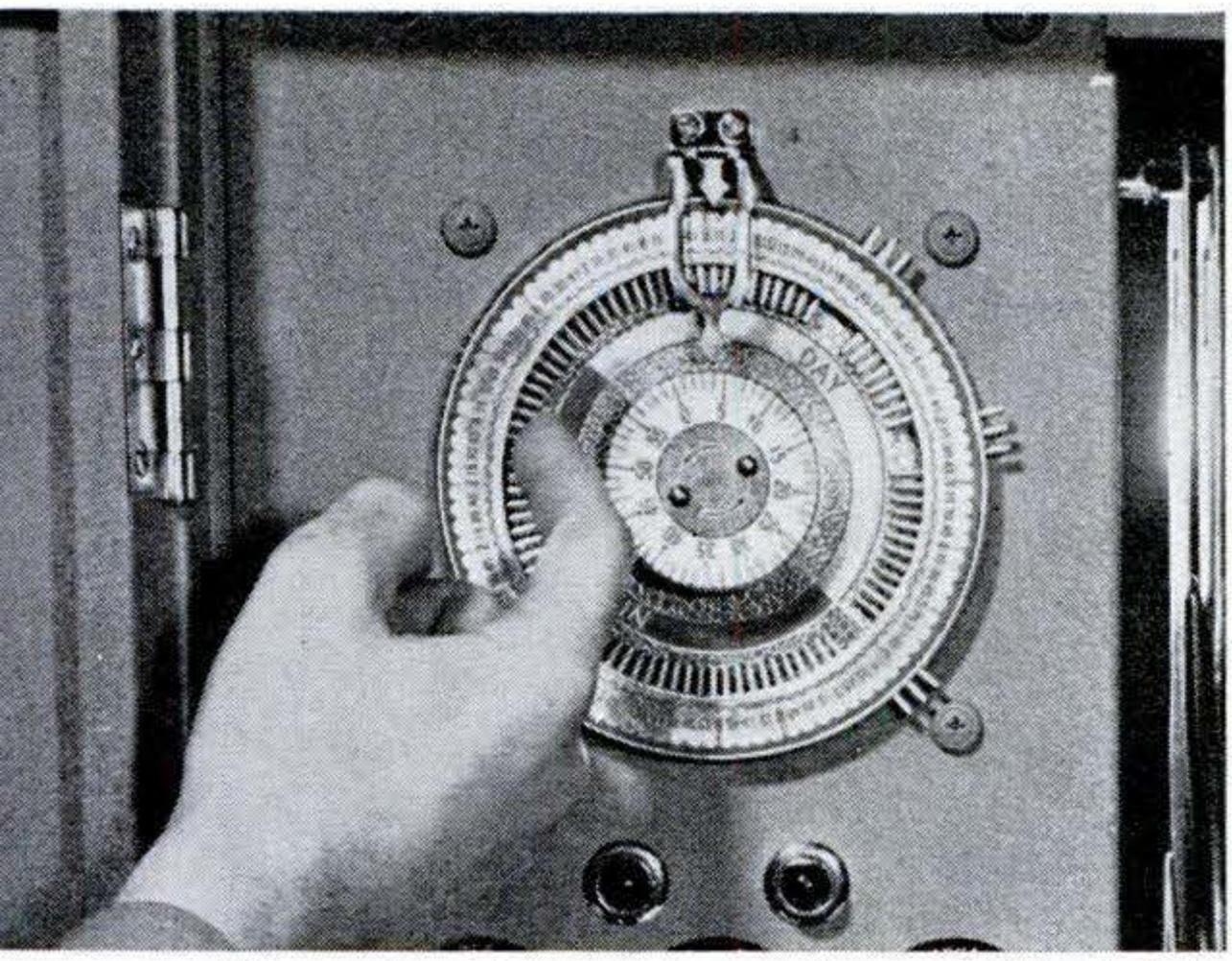
PS photos by Hubert Luckett

THIS phonograph can play for more than 14 hours without repeating a selection—and without a hand touching it. What's more, it can turn itself on and off at pre-set intervals any time of the day or night.

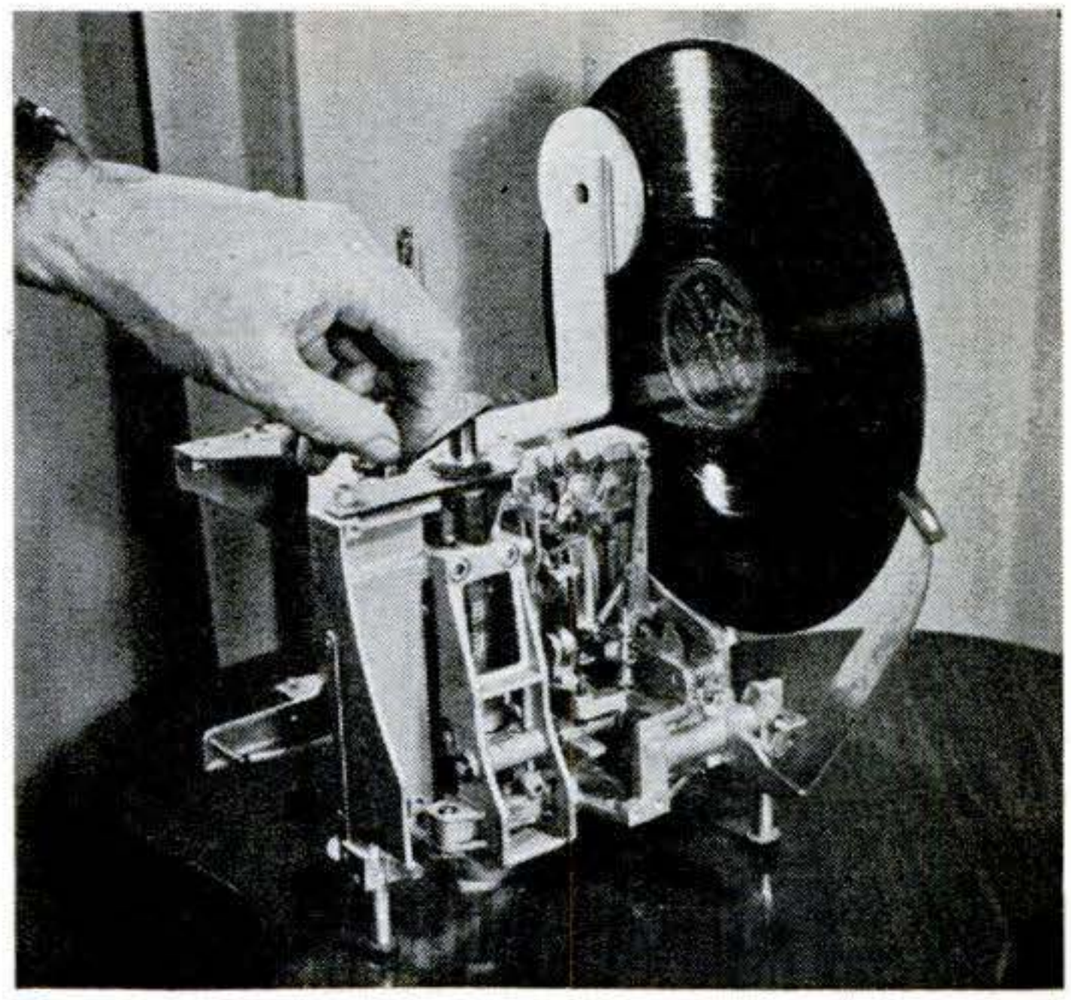
After a few manual settings, the new Select-O-Matic 200 Library Ⓣ does its own thinking. A mechanical "brain" on a track behind a rack holding 100 records (200 sides) goes to the desired disk, lifts it to a turntable, and plays either or both sides. When finished, the record is returned to its slot, and the player carriage moves to the next selection. Ordinary 10- and 12-inch records may be intermixed in the rack. Once filed, they need never be touched until replaced.

The industrial model shown here was designed primarily for factories: it has been found that music boosts morale and reduces fatigue. A whole week's programs of 15-minute concerts once each hour of an eight-hour day can be laid out in advance. It can also be used in clubs, department stores—even dance halls. Optional are an AM-FM radio and an amplifier for remote-speaker outlets that can double as a public-address system. The maker, J. P. Seeburg Corp., of Chicago, also produces a home set, complete or to be plugged into a radio.

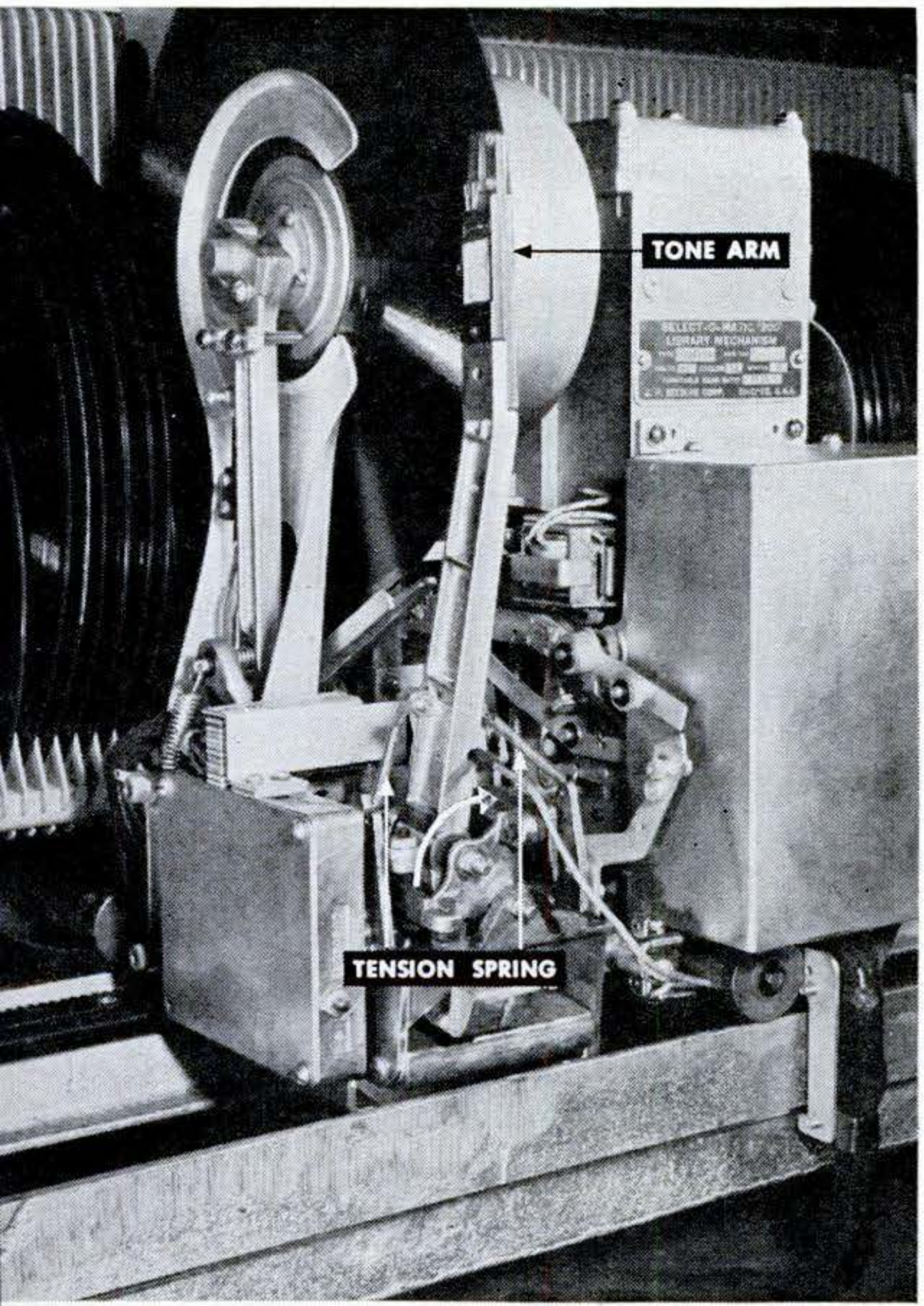
Copyrighted material

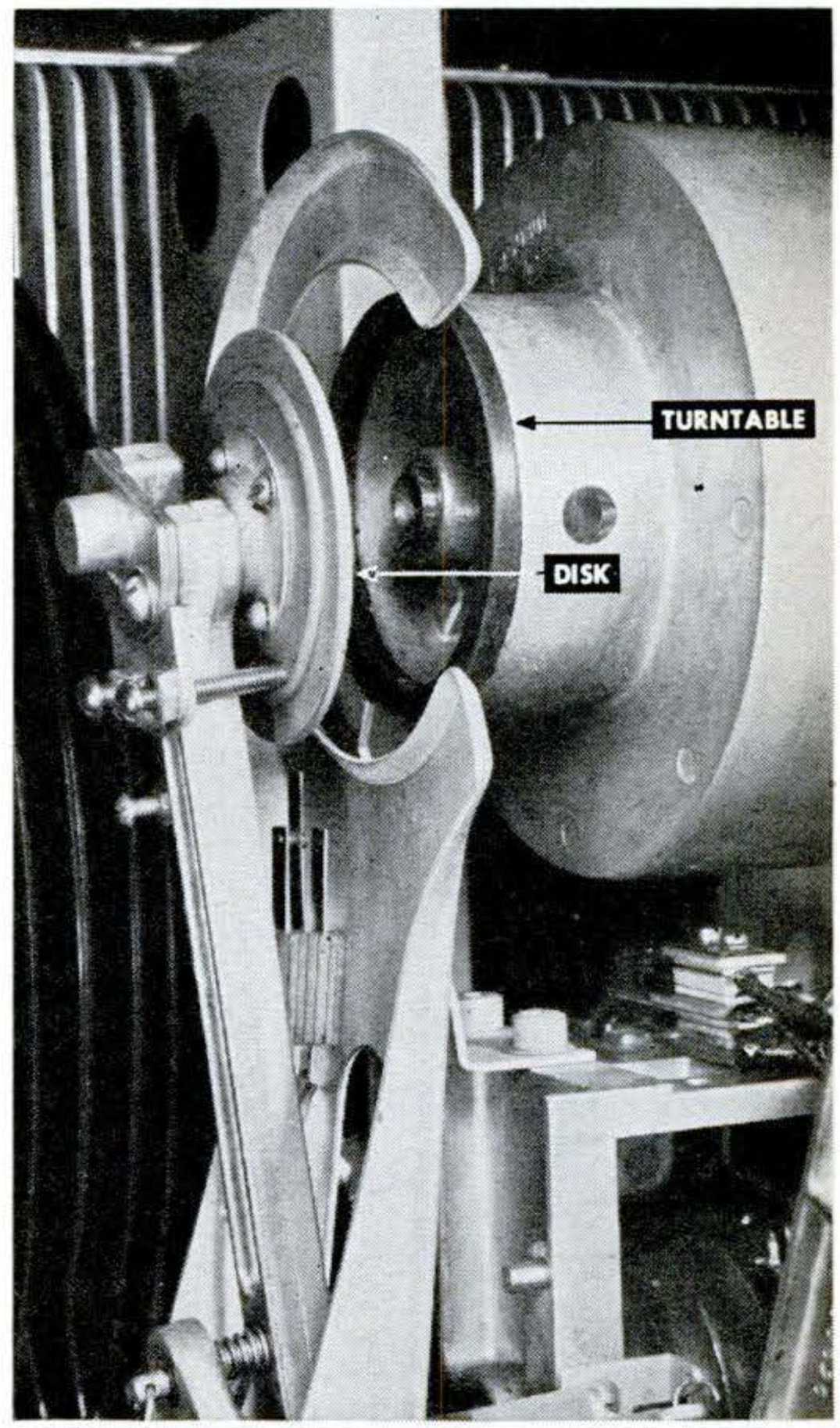


By setting the program timer, calibrated in 15-minute intervals, the operator can choose in advance the periods when the Select-O-Matic Ⓣ will automatically start and stop playing.



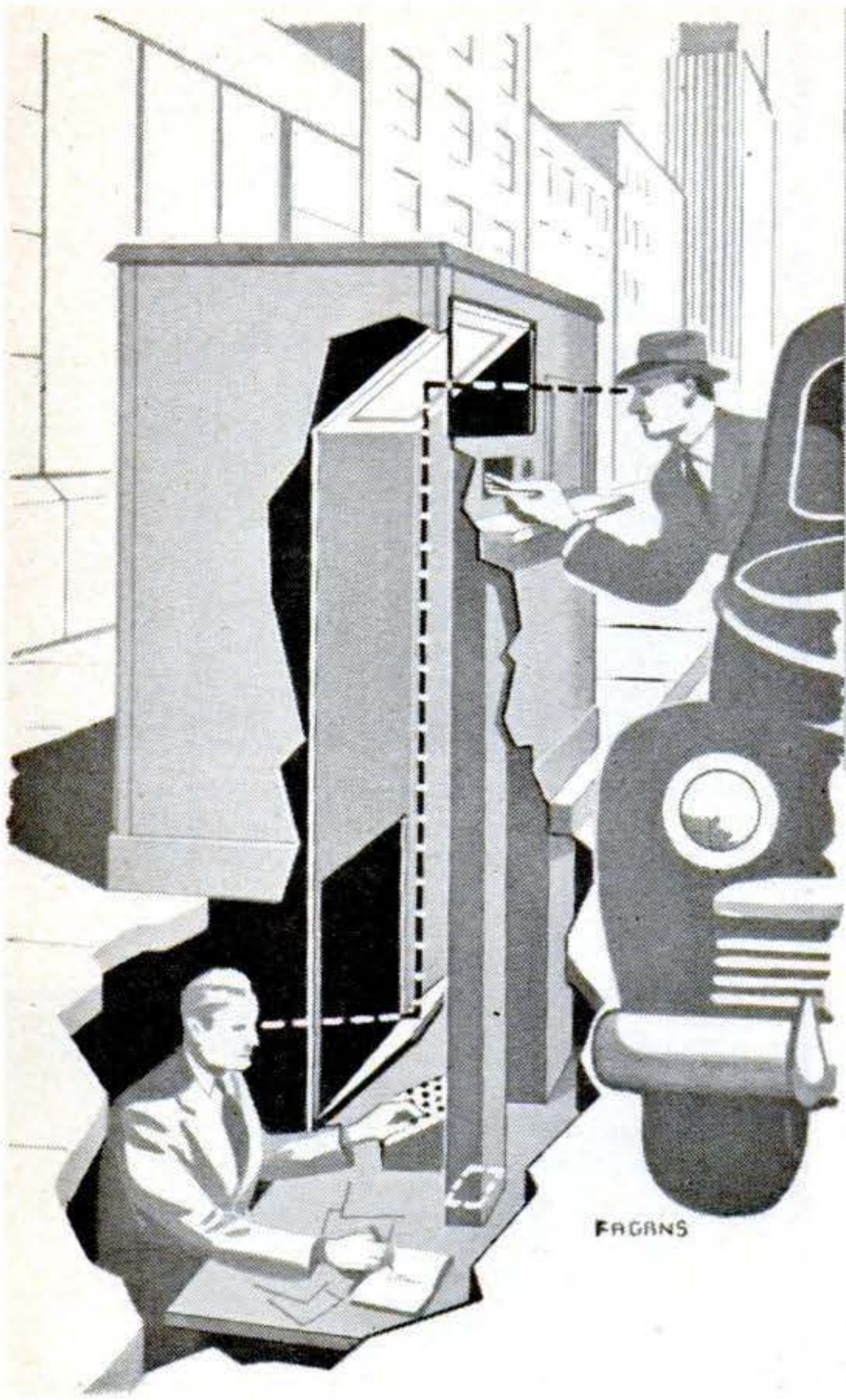
Hand-operated mockup of phonograph mechanism shows how an arm picks out a record and pushes it toward the turntable, represented in the photograph by the white disk.

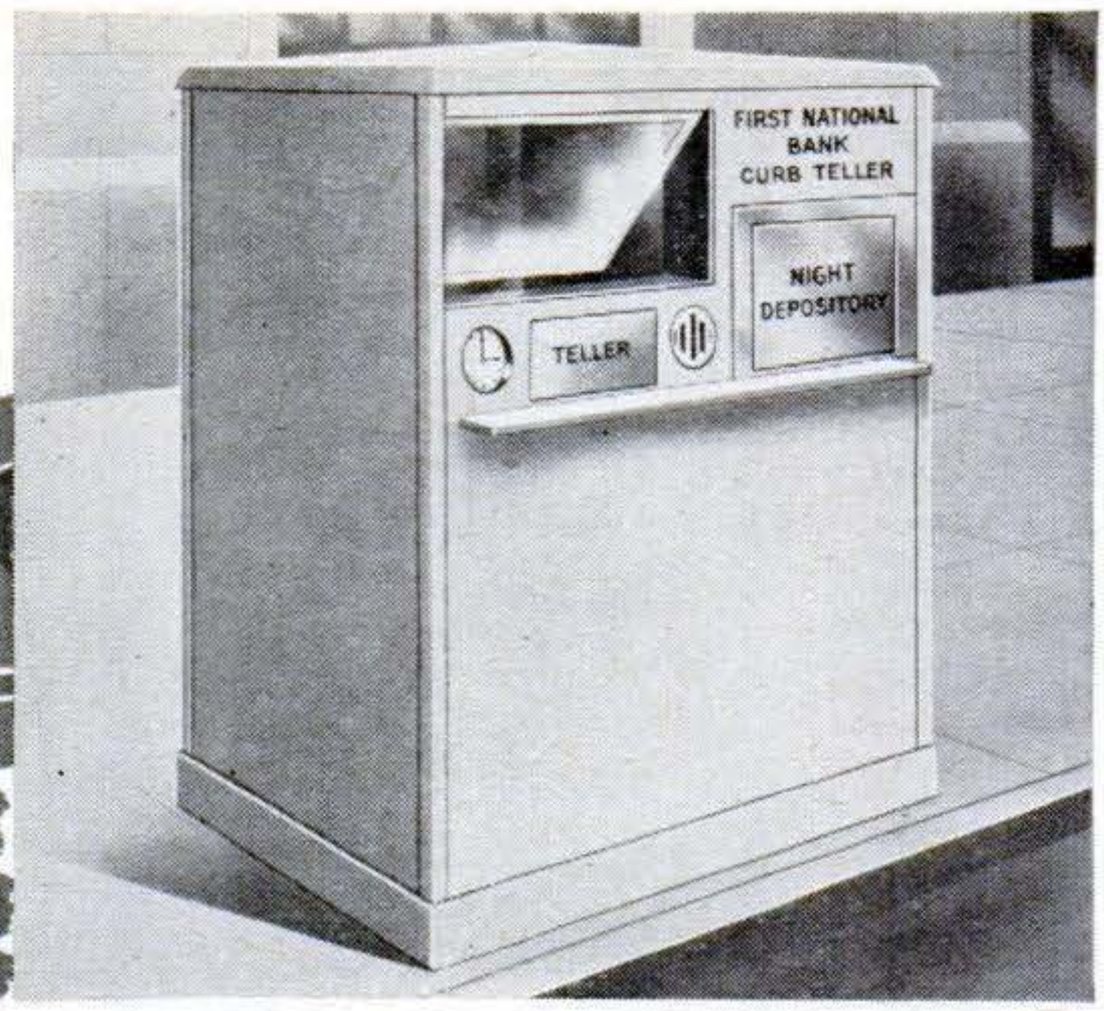




"Brain" of the player, located behind the library, travels along a track until it reaches record to be played. A system of levers then pulls out record onto vertical turntable and sets tone arm into position, above left. To play the opposite side of the record, the mechanism returns it to its slot, the tone arm then pivots to the right, the record comes out again, and the stylus on the left side of the tone-arm head is held against the record by tension springs. Close-up, above right, shows turntable. Disk with spindle centers record, clamps it to turntable.

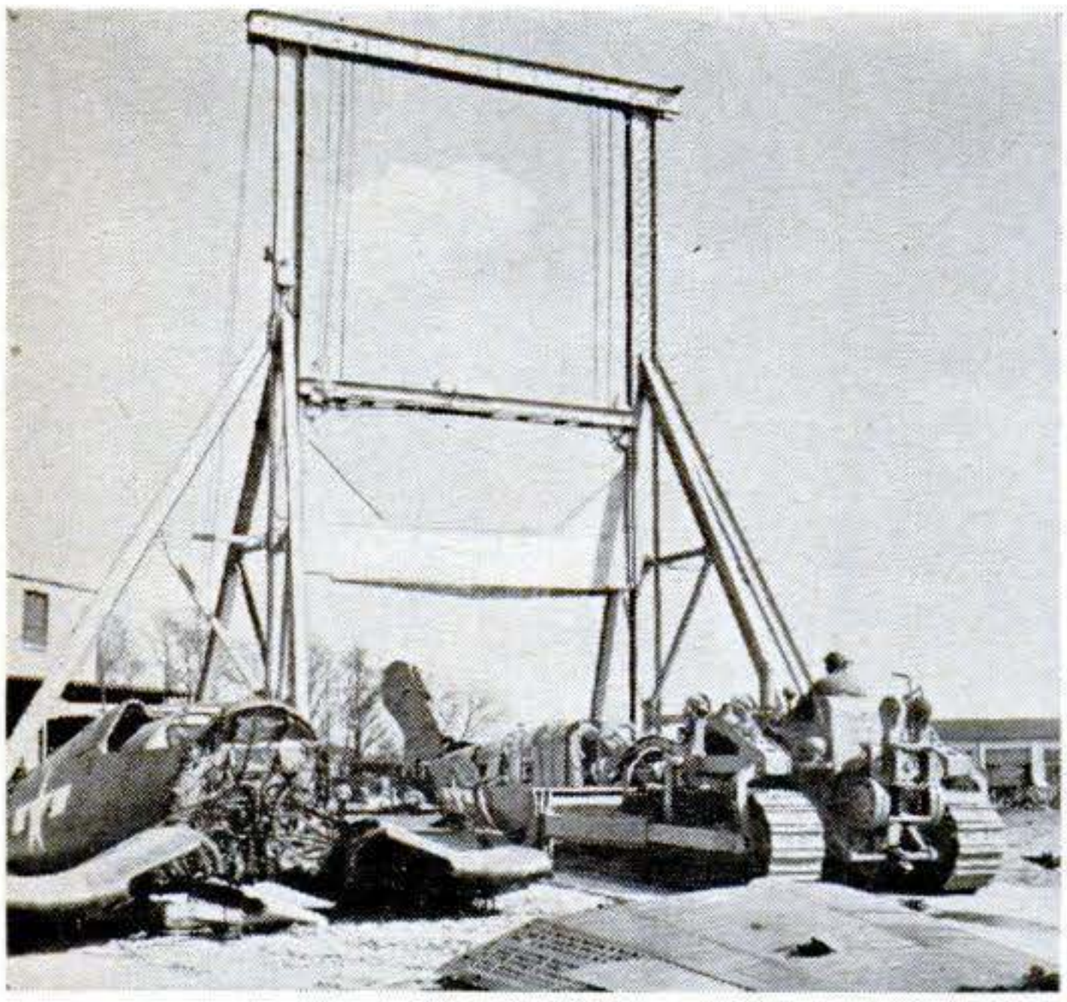
Copyrighted material





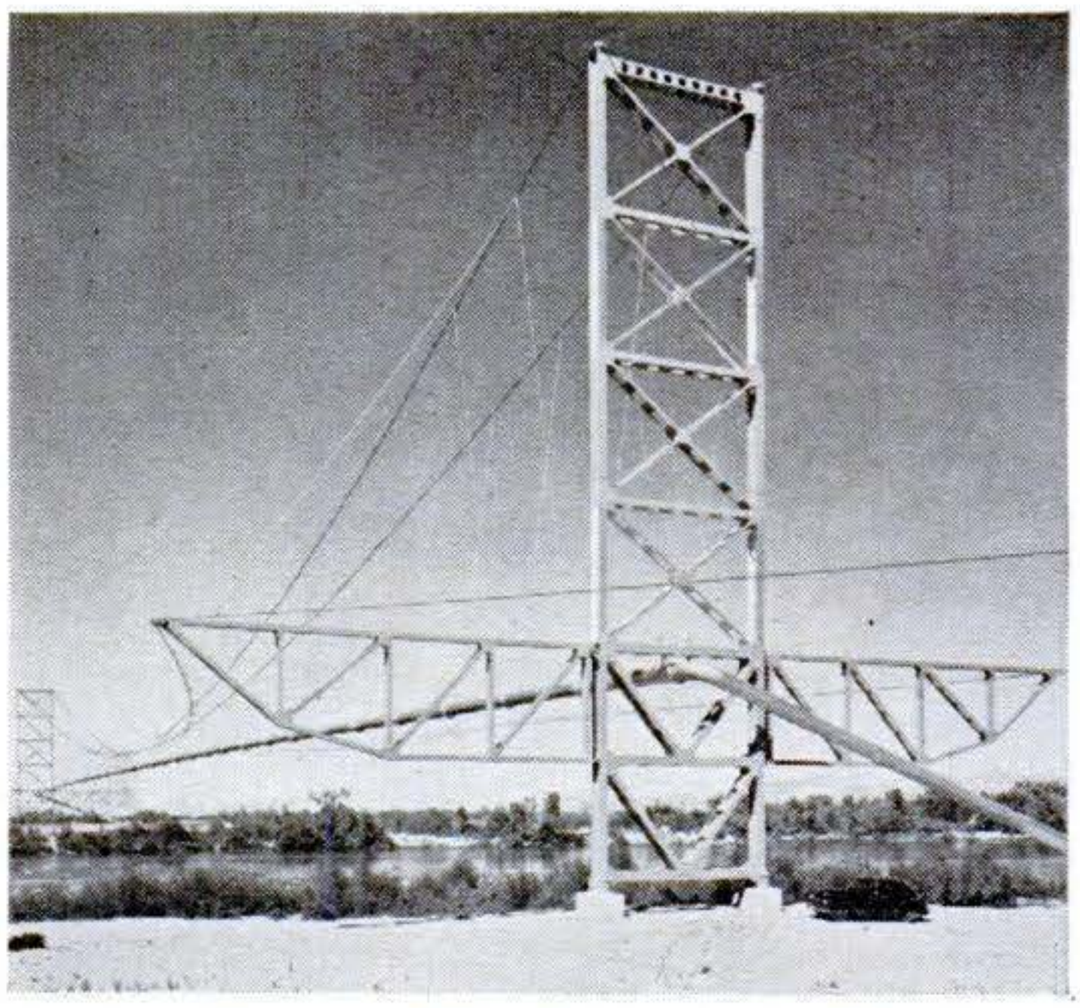
Curb Bank Uses Mirrors

CURB service has moved from hot-dog stands to banks. You can drive right up to this Curb Teller Ⓣ and do your banking without ever leaving your seat. Developed by Duplex Electric, the bullet-proof curb-side unit (above) holds a two-way intercom and the top mirror of a periscope. Below the sidewalk, the teller is protected against bandits, but can see his clients through the periscope and talk to them on the intercom. Money and bankbooks are exchanged on a small electric elevator.



Guillotine Cuts Planes

THIS modern guillotine is speeding the salvage of wrecked and obsolete airplanes at the Naval Air Station, Norfolk, Va. The huge, 6,100-pound blade slices its victims into small sections, which are then melted down, cast into ingots, and sold at auction.



Gas Pipe Takes to Air

THIS big, 30-inch pipeline carrying natural gas from Texas to Southern California is getting a 1,038-foot lift across the Colorado River at Blythe, Calif. Two 116½-foot towers support the pipe, while horizontal trusses keep it from swaying in high winds.

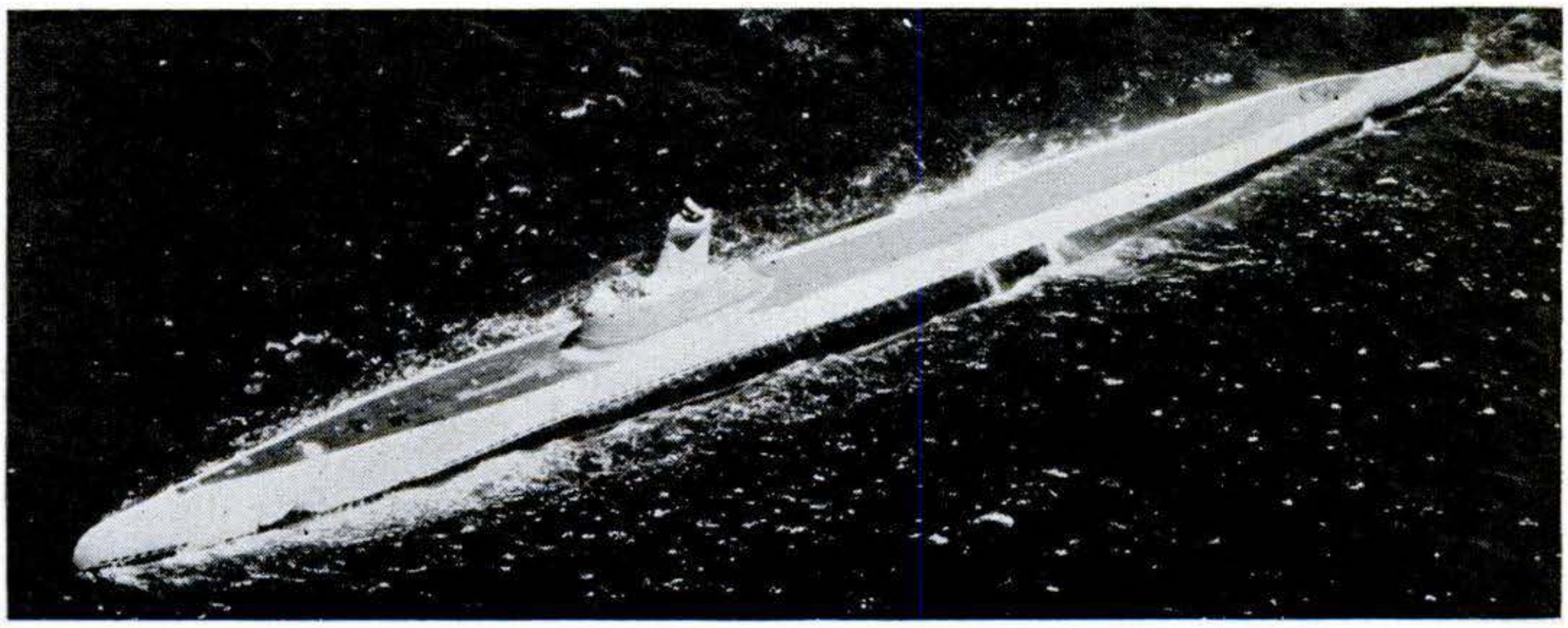
Copyrighted material

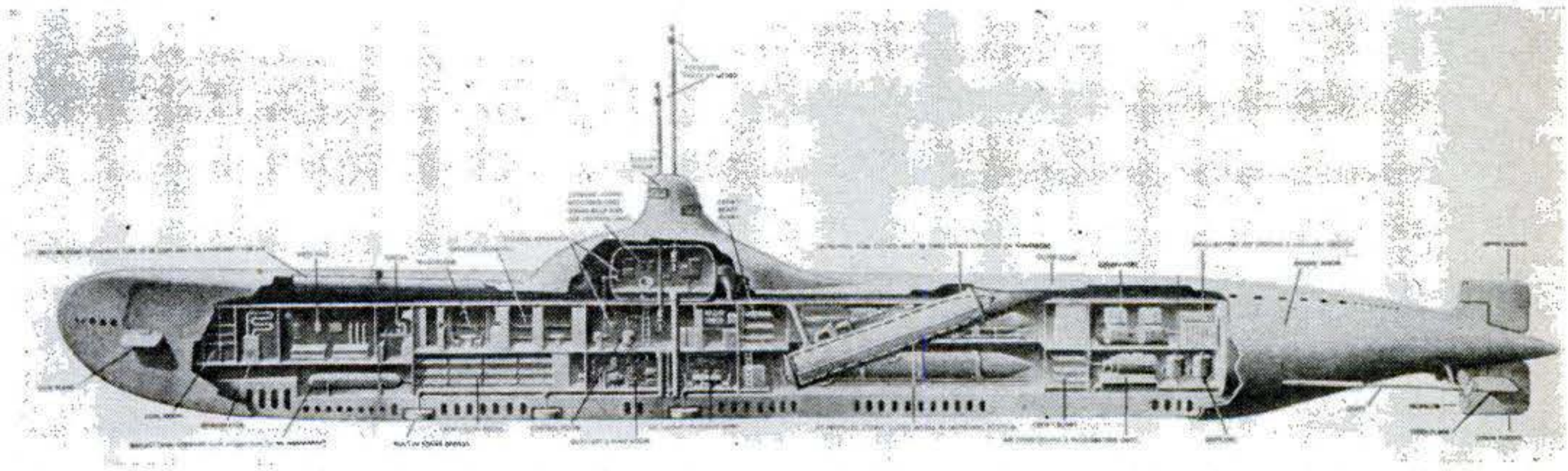
Streamlining Speeds New Subs

SLEEK as seals, these recently streamlined underwater craft provide a preview of what the best dressed submarines of the future will—and won't—wear. Designed to increase submerged speed by cutting underwater resistance, alterations on the USS *Pomodon* (above) and the USS *Odax* (below) include a reducing diet for the superstructure and the removal of deck guns and other topside mountings. Both have a new version of the German "schnorkel" breathing tube.

Submarines are said to be the naval type least vulnerable to atomic attacks, and these changes are part of an over-all program to bring our undersea service up to date in the light of recent research. Greater range and the ability to stay under water for long periods are two important objectives. Design changes will also improve the subs' resistance to the crushing effects of atomic bombs.

Operation of the altered subs is expected to help perfect plans for four new ones.





This inside view of a new type of submarine is reprinted from the April, 1947, issue of POPULAR SCIENCE. Provision has been made for the launching of jet-propelled, atomic guided missiles.

Copyrighted material

Arctic Mine Yields Atom Ore

Port Radium, site of Canada's rich radium and uranium mine, is on huge sub-Arctic lake.

THE most important mine in the Western Hemisphere—since that day three years ago when the atomic age began—is deep in Canada's Northwest Territories, only 26 miles below the Arctic Circle. From this desolate spot come great quantities of pitchblende, source of radium and uranium.

Now operated by a company controlled by the Canadian government, the mine at Great Bear Lake was discovered in 1930 by an Ontario prospector. Its prewar production of radium exceeded a million dollars a year in value. Since the start of the Manhattan Project, it has furnished huge, undisclosed amounts of uranium oxide. Once discarded as waste after the radium was removed, the oxide is now the source of uranium-235, raw material of atom bombs.

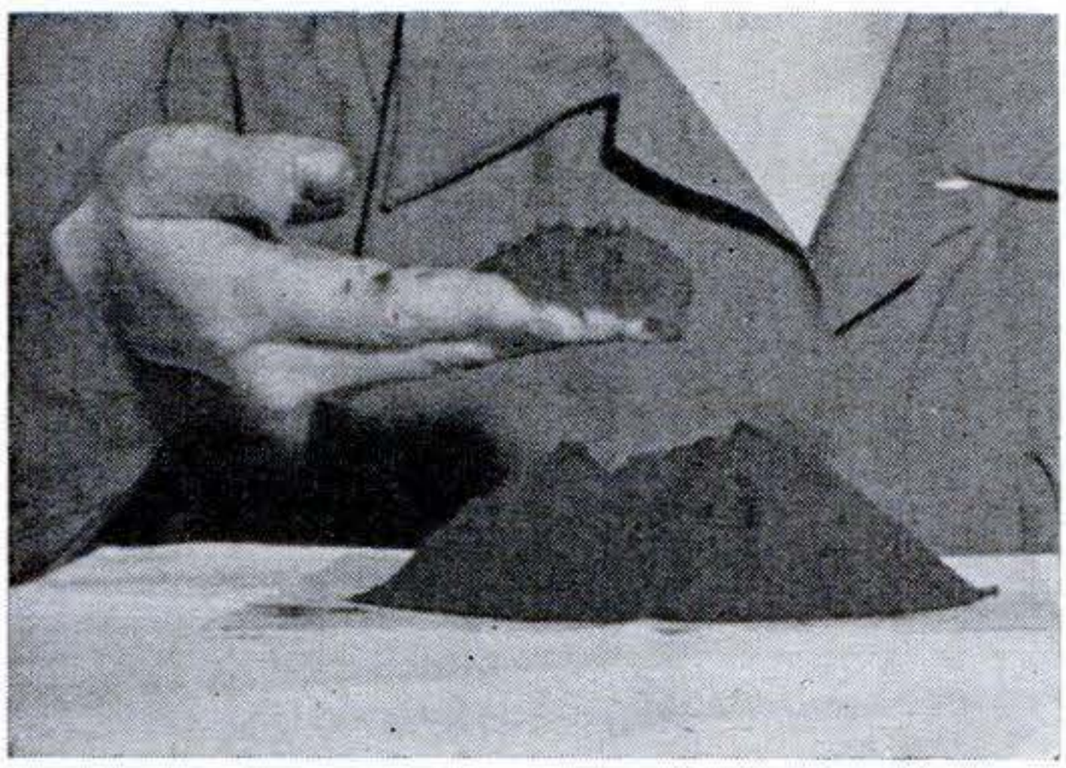
The Canadian mine is the richest in the world, furnishing pitchblende that is 40% to 50% pure uranium oxide. However, it ranks second in output to deposits in the Belgian Congo in Africa.—A. H. MITCHELL.

Pitchblende is mined the same way as coal. In photo above, a hole is drilled in rock face with pneumatic "stoper." Dynamite charges then blast loose the ore, and it is shoveled into cars.

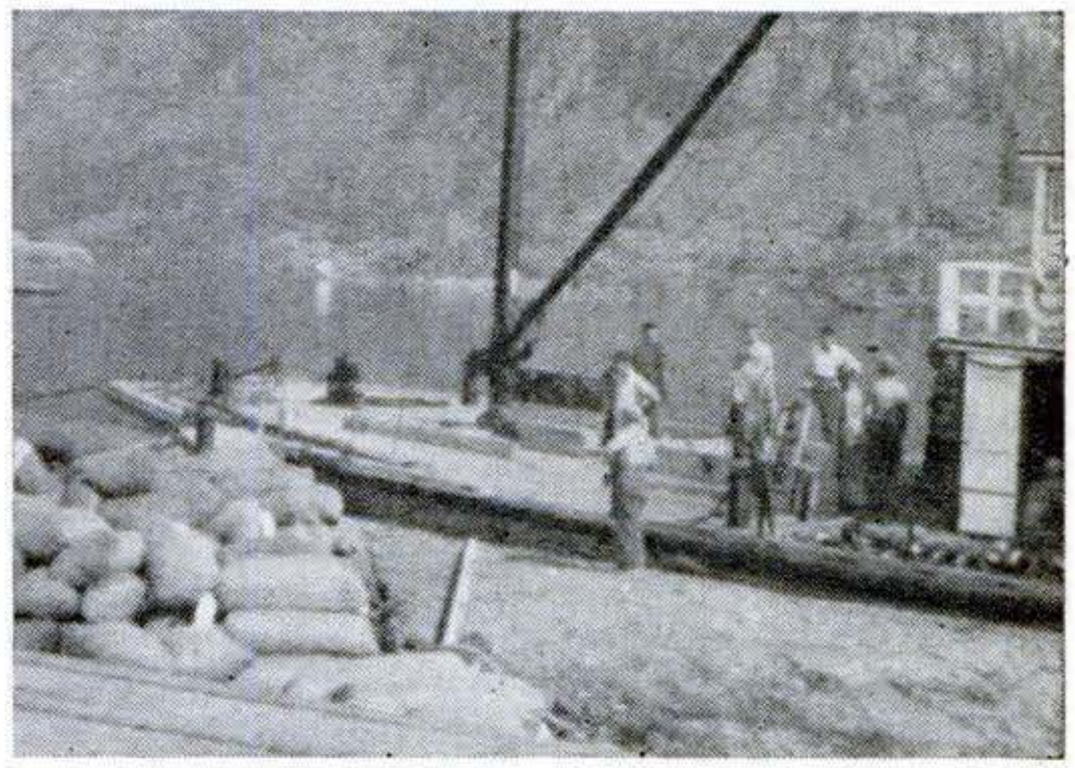
Copyrighted material

After an electric hoist carries the ore to the top of the mine-head tower, it rides a conveyer belt to the mill. Pieces must be broken and rock removed before the ore can be ground.

The powdered ore is concentrated by mixing with water and shaking the mixture on vibrating tables. Heavy pitchblende (uranium is the densest natural element) collects at one side.



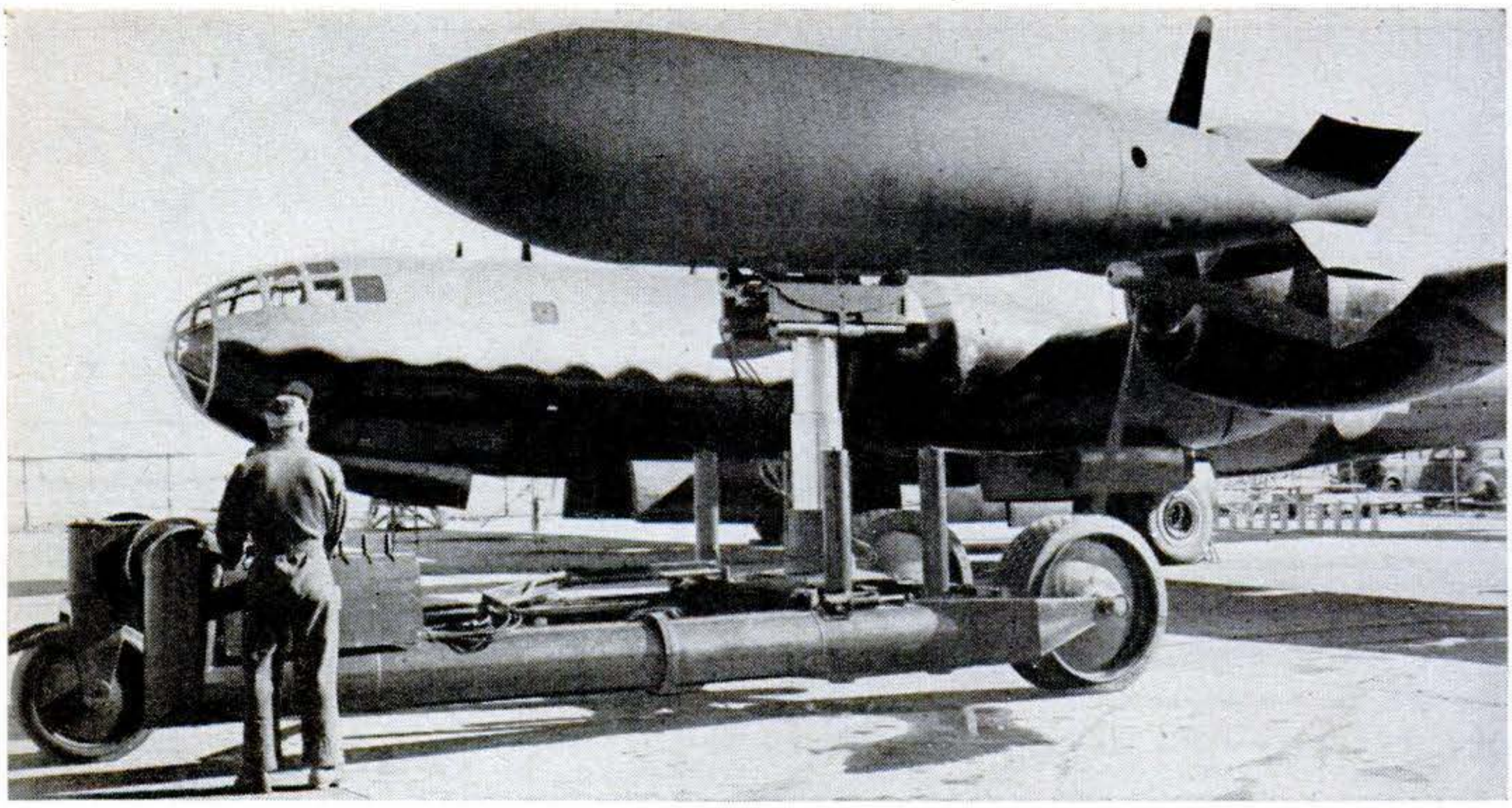
This black powder is concentrated pitchblende, mostly uranium oxide. A ton of uranium oxide contains less than a hundredth ounce of radium, and about 12 pounds of atom-bomb U-235.



Final processing of the pitchblende concentrate into radium is performed in a plant 4,000 miles from Port Radium. In summer, the heavy sacks are carried by boat to the nearest railway.

The winter cold freezes Great Bear Lake, providing an excellent landing surface for planes that transport the pitchblende concentrate to Edmonton and bring back supplies during the months when water travel is impossible. Dog teams furnish the only other contact with the outside world, but are used mainly for communication with other settlements nearby.

Copyrighted material



B-29 Lays Biggest Egg

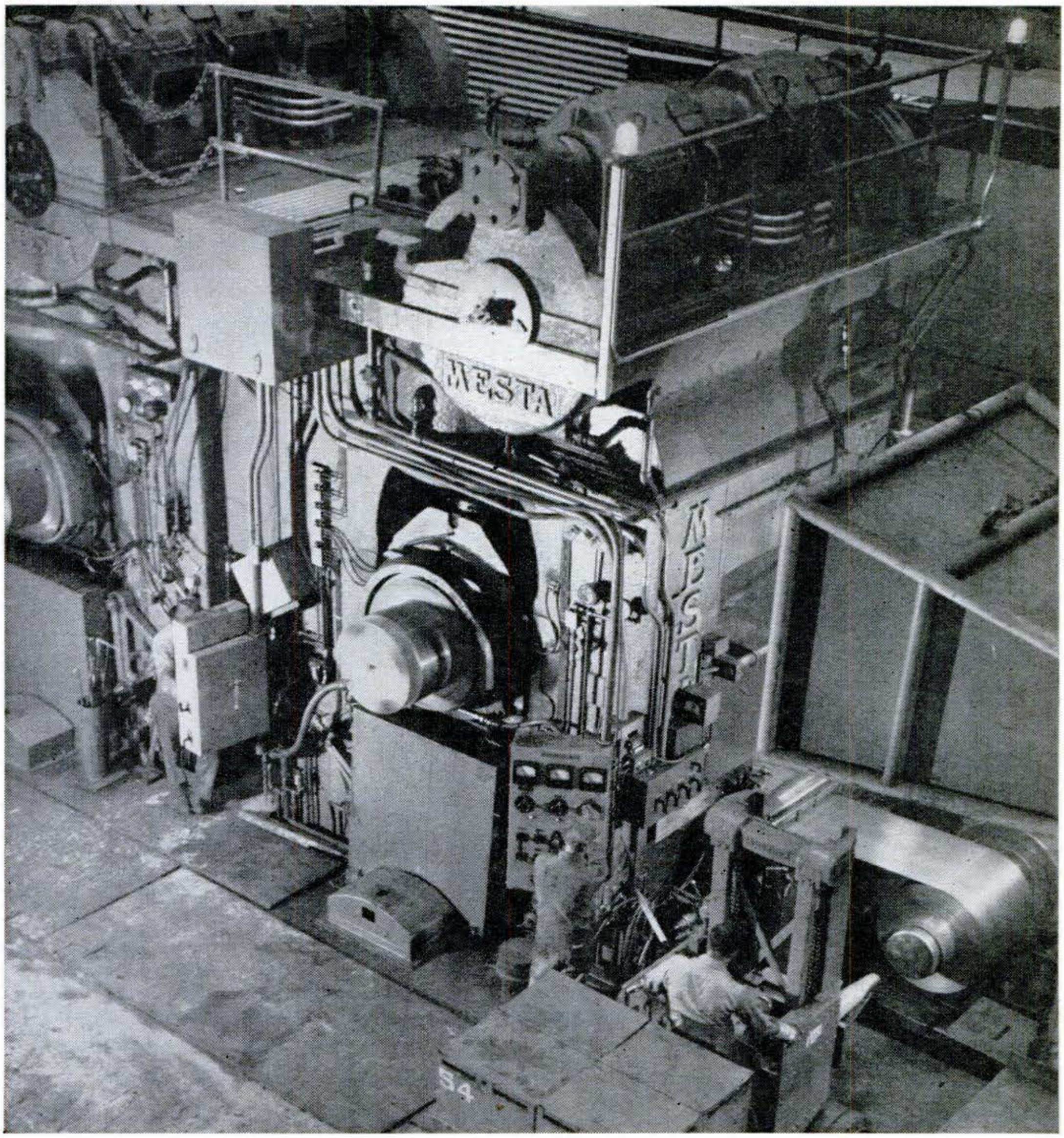
THIS 21-ton giant is almost twice as big as any bomb previously dropped from a plane. It recently hurtled from the modified bomb bay of a Superfortress at Muroc (Calif.) Air Force Base. It is a general-purpose bomb, 4½ ft. wide and 26 ft. 10 in. long. During tests a dud was used to obtain flight characteristics and to determine what happens to a plane in flight that suddenly loses 42,000 pounds.

To make room for the bomb, a portion of the plane's body section under the wing was cut away. The rear bomb-bay doors were removed entirely, and the front bomb-bay doors were cut away to allow the nose of the bomb to protrude. To load the huge missile, Boeing designed a special 50,000-lb. lift (shown above), operated by one man.

Gravity Aids Grocers

GROCERS' shelves are never bare when the Food-O-Mat Ⓣ is on hand. This self-service, gravity-feed food dispenser rolls or slides canned, bottled, and packaged groceries practically into shoppers' waiting hands. As one item is removed from the end of a slanted chute, gravity pulls down another, saving shoppers' time and insuring freshness. Filled from the rear (right), it keeps stock and clerks behind the scenes, is said to save up to 50 percent in floor space and personnel. Made by the Grand Union Co., the 84-foot unit comes in 24 sections, each 3½ feet long, and can hold 1,900 separate items.

Copyrighted material



Great size, great precision, and great speed are combined in this new steel-strip rolling mill.

Mill Rolls Steel At 70 Miles an Hour

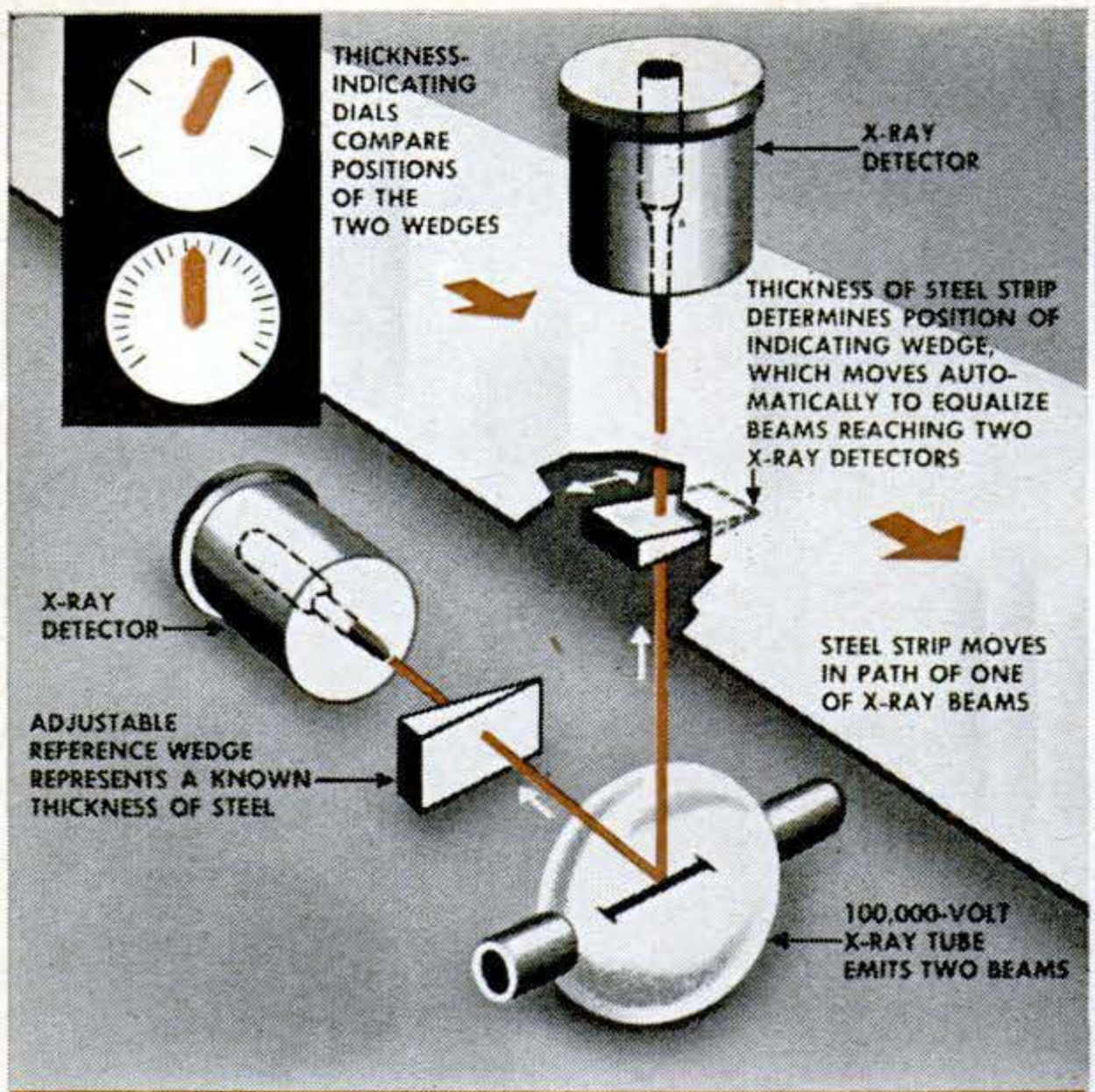
By Alden P. Armagnac

THE mechanical monster above is steel's fastest rolling mill. It is also the most powerful, the biggest, and the heaviest of its kind. Since speed increases the uniformity of the product, this mill not only shoots out more but also better steel strip.

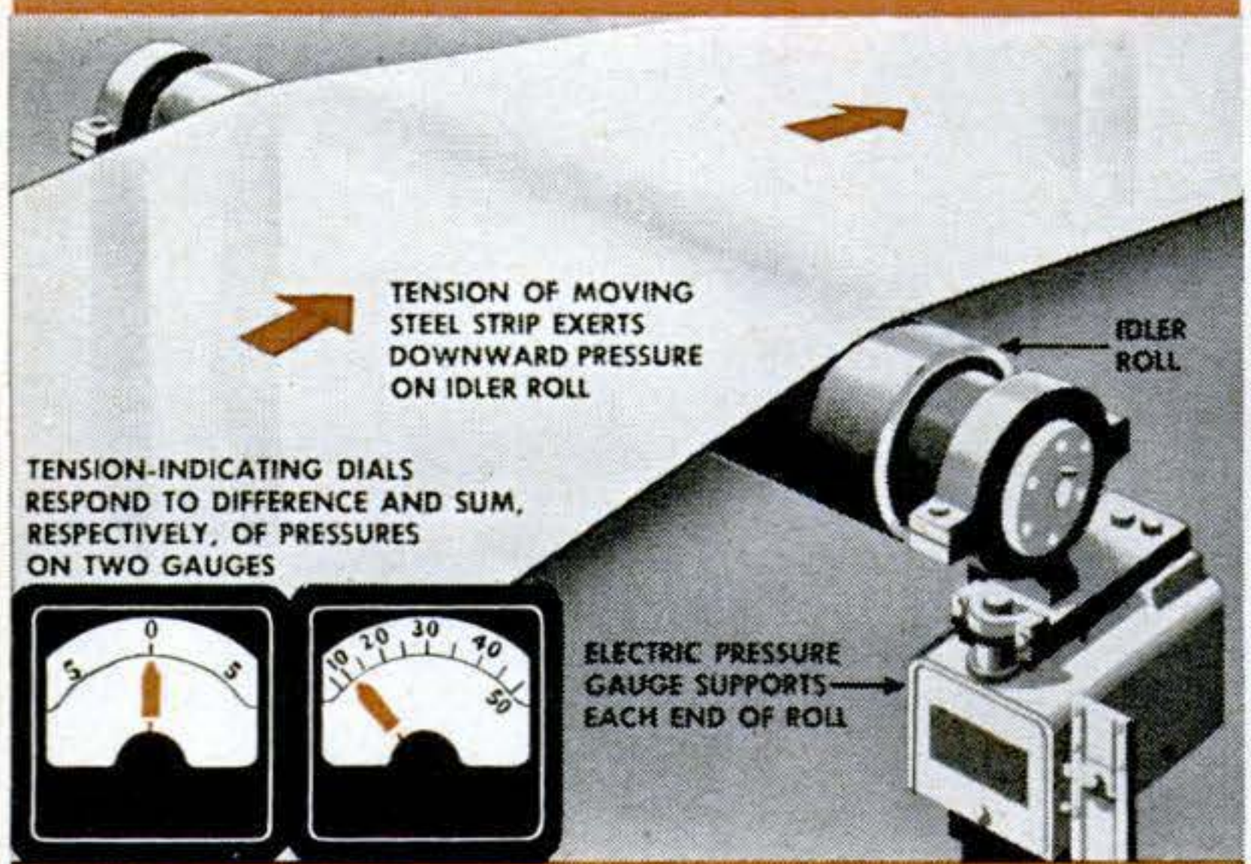
Recently placed in service at the Aliquippa, Pa., plant of the Jones & Laughlin Steel Corporation, the mill turns out the thin steel that is tin-plated and used in cans.

Steel men call the machine a "five-stand tandem cold strip mill." It weighs as much as a couple of destroyers. Its reinforced concrete piers go down 50 feet to bedrock.

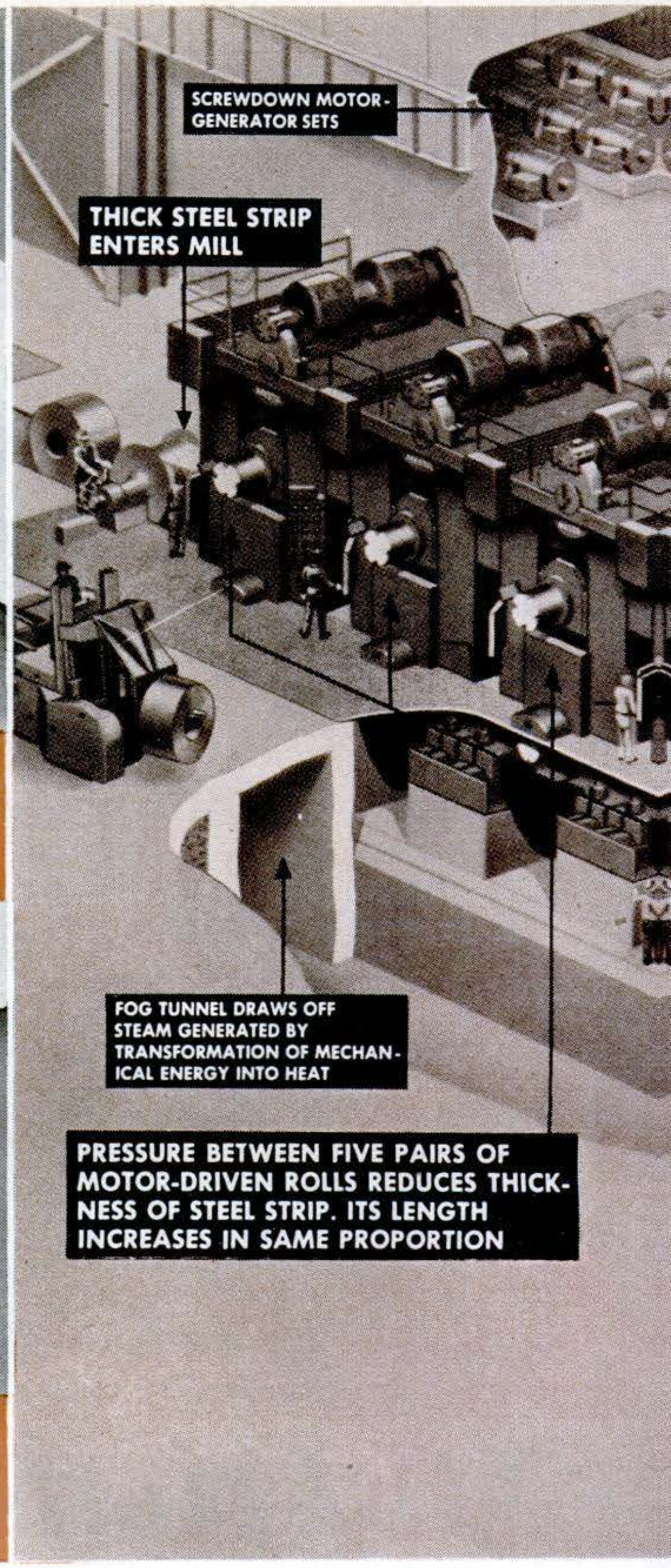
Copyrighted material



Novel features of fastest steel-rolling mill, shown in large drawing at right, include X-ray thickness gauge above. It measures final thickness of the flying strip without touching it.



Tension on strip at five key points is shown by electric tensiometers like one above. Excess tension on either edge registers on left-hand dial, and total tension on right-hand dial.

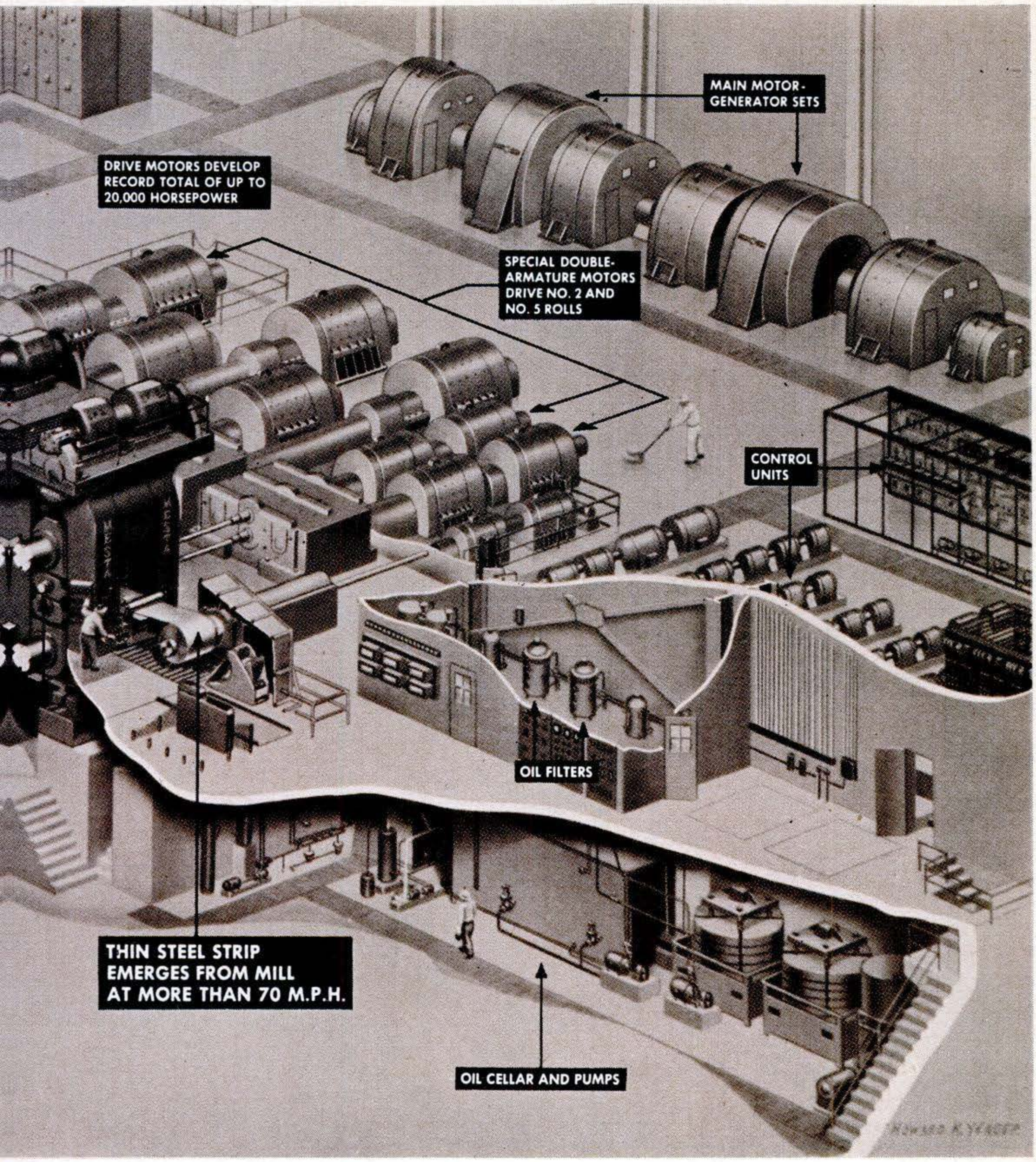


Yet the 4,000-ton giant is so delicately responsive to its controls that it can be regulated with micrometer precision. Experts credit the builder, the Mesta Machine Company of West Homestead, Pa., with a major advance in the art of steel making.

A mouthful for this steel-hungry giant is a 15-ton, 5½-foot-high coil of the thin metal that the industry calls steel strip, measuring about 1/11 of an inch thick and two-thirds of a mile long. By applying terrific pressure, wringerlike motor-driven rolls reduce this material to 1/100-inch thickness, or about one-ninth of its original gauge. Since the rolling increases its length in the same proportion—nine times—the product is a six-mile-long ribbon, which winds up into a coil of the same weight and over-all size as the one fed in. Widths up to 36 inches may be rolled.

A whole coil takes only five minutes to hurtle through the rolls. At this express-train

Copyrighted material



speed, the new mill would require less than an hour to roll a 30-inch-wide band long enough to reach from Pittsburgh, Pa., to Youngstown, Ohio.

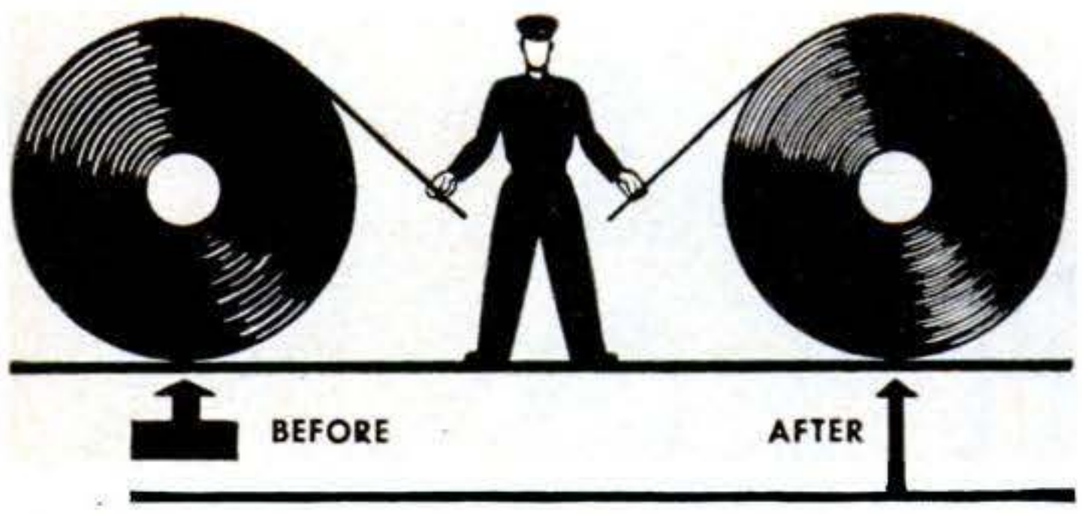
So much mechanical energy turns into heat in kneading the metal that it takes a torrent of water to cool the massive rolls. The steam generated would hide the machine in a blanket of mist but for a special fog-elimination system that sucks away the vapor-laden air through a tunnel and exhausts it through a stack to the outdoors.

Eight giant drive motors, which together can develop more than 20,000 hp. continuously without overheating, make up the largest power plant ever harnessed to a cold-rolling mill. By using twin armatures in tandem on a single shaft for the three most powerful motors, General Electric designers avoided the excessive inertia or "flywheel effect" of big rotors. This enables the mill to be started and stopped with phenom-

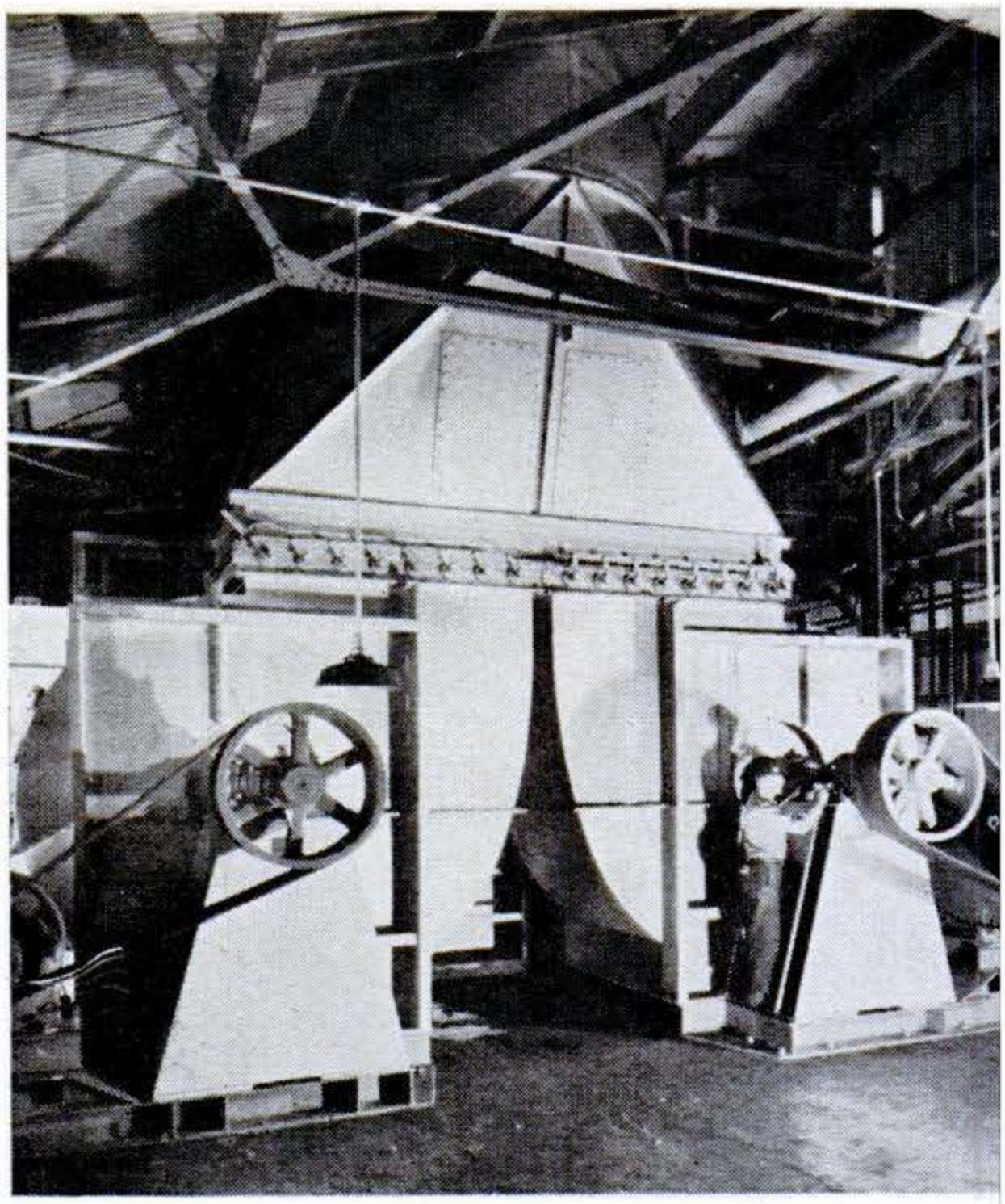
Copyrighted material

enal speed. It accelerates from a pace of 300 to 4,500 feet per minute, or from 3½ to 51 miles an hour, in just six seconds. Auxiliary motors operate "screwdowns"—the mechanisms that adjust roll spacing to determine steel thickness—of record power and quick action.

Each passage between a pair of rolls—there are five in all—lengthens and speeds up the moving strip. To do this, each successive pair must revolve faster than the one before. Speed control of exquisite accuracy strikes a delicate balance between taking up the slack and avoiding excess tension that would break the thin strip. Rotating electrical devices called amplidynes individually regulate the great drive motors, and instantly detect and correct any variation from their assigned speeds.



Steel is fed to mill and delivered in coils like these. Cross sections below them show actual thickness of raw material and finished product, and relative length before and after rolling.



Fog elimination system uses two 75-horsepower fans, above, to exhaust steam generated from cooling water by the enormous amount of mechanical energy that the mill turns into heat.

Along the right of way for the flying ribbon of steel, like the signal system that safeguards high-speed trains, ultramodern instruments aid the "dispatchers" who watch the control panels.

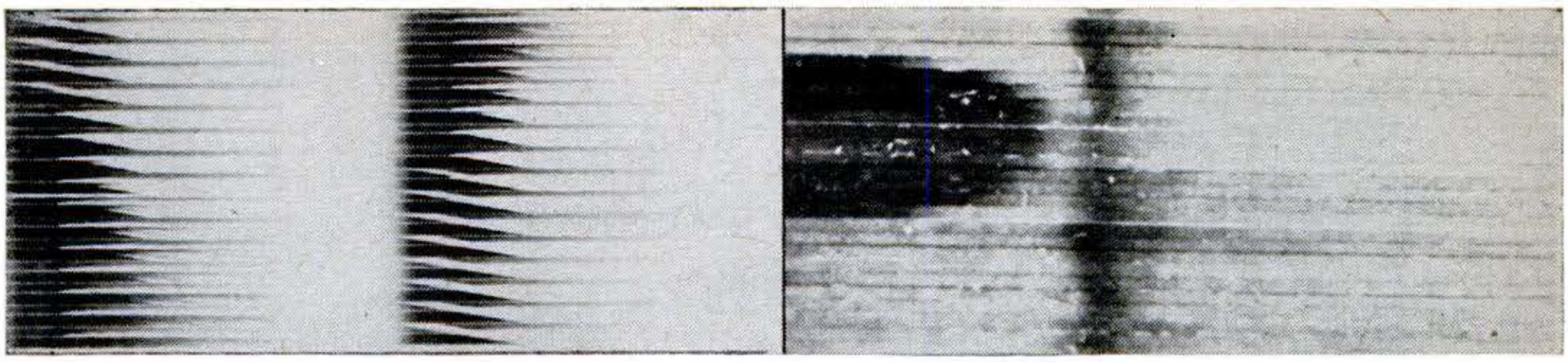
To warn of uneven or excessive pull on the strip, a device called an electric tensiometer is mounted between every two sets of rollers, and between the last one and the delivery reel. As a "feeler," this instrument uses an idler roll, over which the strip makes a slight change in direction. Consequently the tension of the strip pushes down against the idler roll, which rests at each end upon an electrical pressure gauge. Too much tension at one edge of the strip means a difference between the pressures on the two gauges, and registers on an electric dial. The total tension on the strip, the sum of the pressures on the two gauges, registers on another dial.

An X-ray thickness gauge checks the thickness of the finished strip "on the fly" as it speeds from the last stand to the delivery reel. Ports in the housing of a 100,000-volt X-ray tube, mounted beneath the strip, emit two beams.

One of these X-ray beams falls upon a detector—a photo cell with a fluorescent coating—after passing through an adjustable "reference" wedge of steel preadjusted to represent metal of a given thickness. The other X-ray beam falls on a similar detector after passing, in turn, through a movable "indicating" wedge of steel and the speeding strip itself. Each detector generates a current proportional to the intensity of X rays reaching it, and a motor automatically balances the currents by moving the indicating wedge back and forth. Thus the position of the indicating wedge for current balance depends upon the difference between the thickness of the steel strip going through the mill and the thickness of steel represented by the reference wedge. Dials indicate the position of each wedge, and comparison of their readings at any moment shows the thickness of the strip.

Today the world's hunger for steel and steel products is straining every facility. The Aliquippa mill is rushing to meet its share of the demand—rushing at 70 m.p.h. END

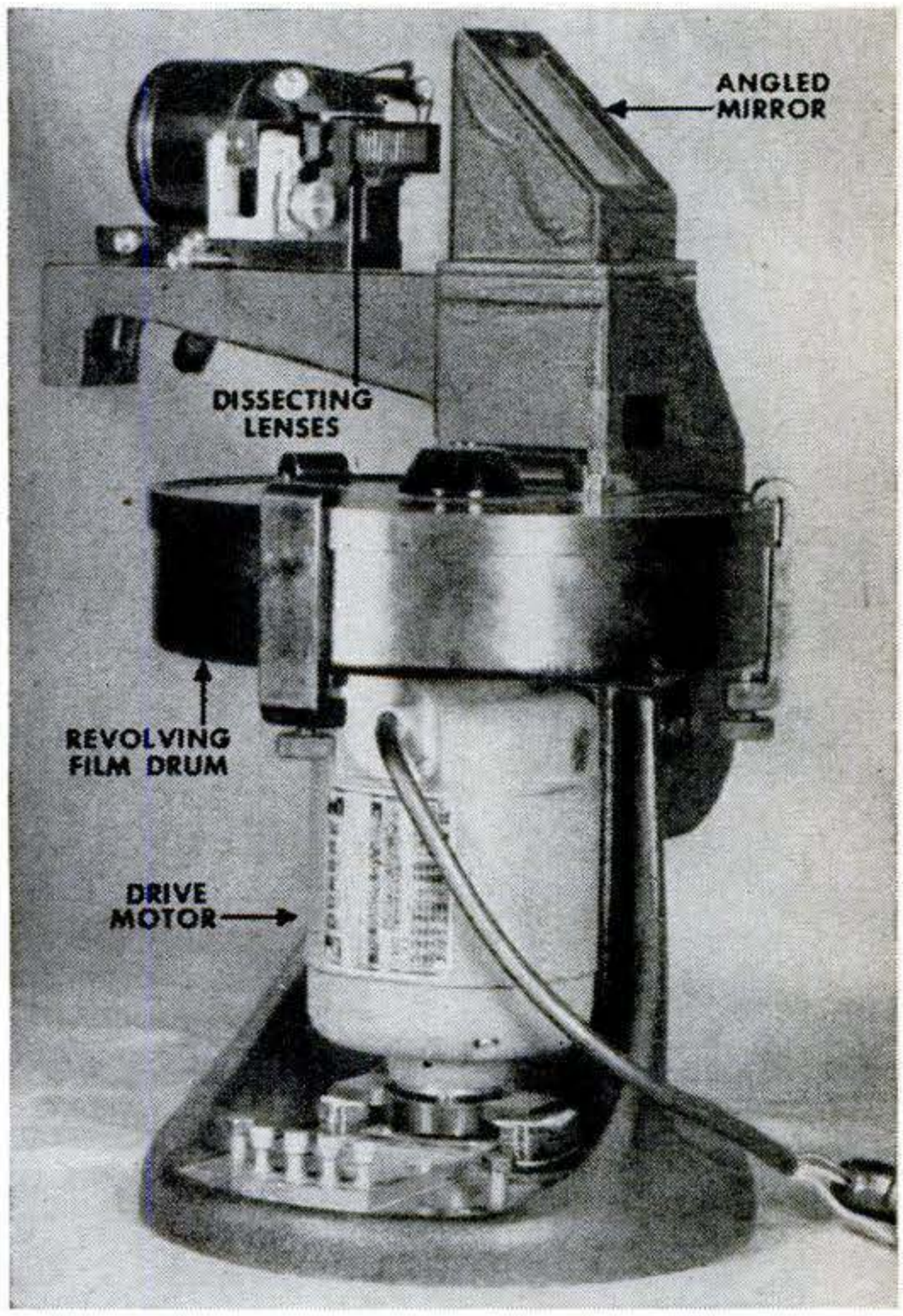
Copyrighted material

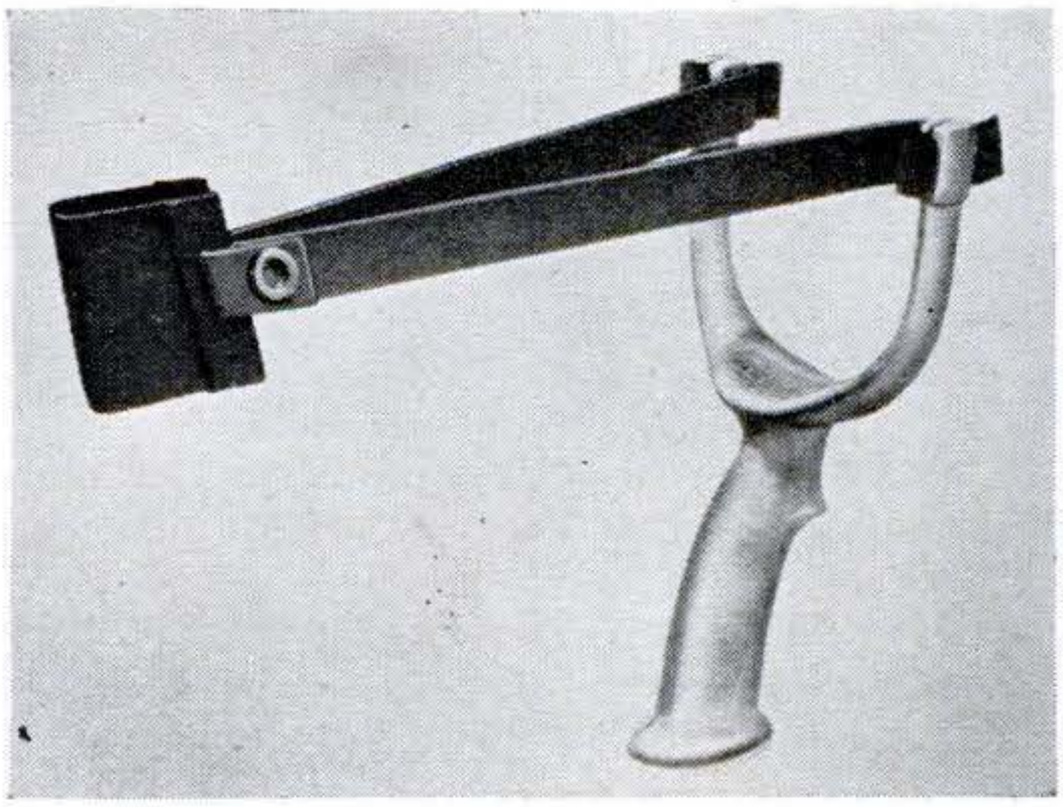


World's Fastest Camera

THE queer-looking pictures above were made with the world's fastest movie camera as it slowed a speeding bullet to an inch-a-minute crawl. The left-hand picture is the negative, made with a lens-and-slit system that dissects the image into horizontal slices and lays them out on the film side by side. Printing back through this same lens-and-slit arrangement reverses the process. The negative produces 2,000 individual movie frames, one of which is at right above. The dark blob is the bullet; the vertical shadow, the target—a sheet of glass.

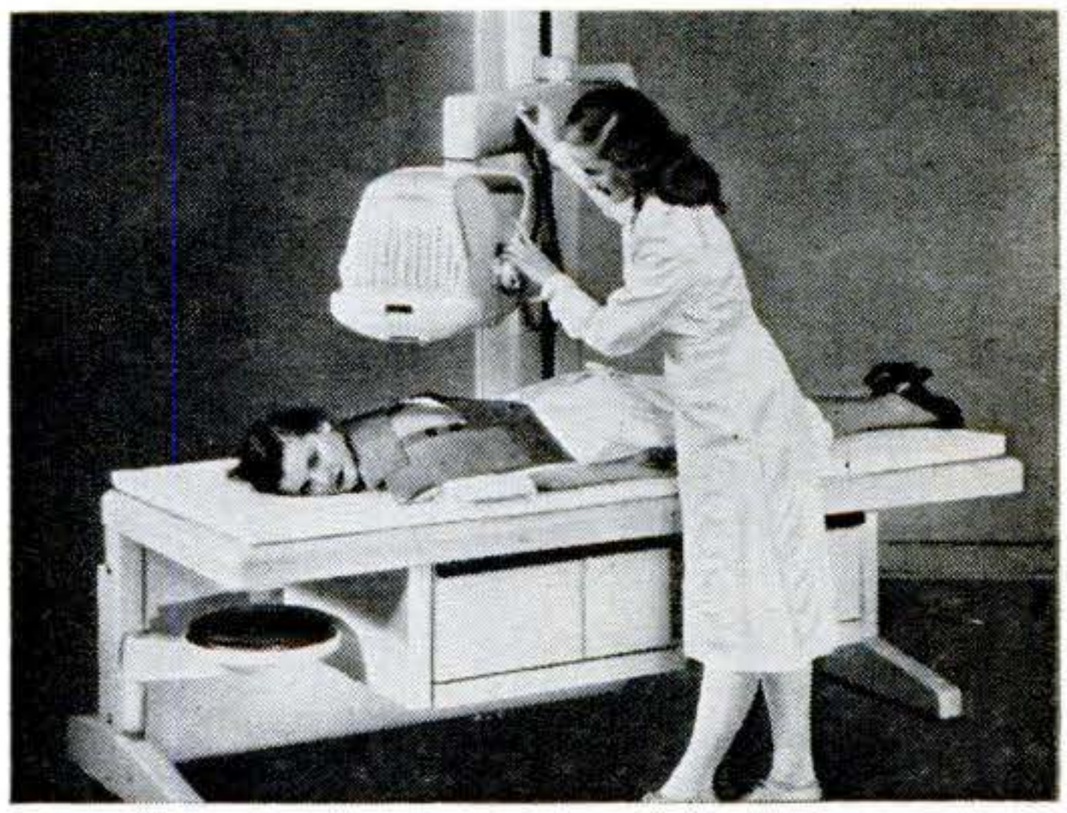
Developed at the University of Rochester, the shutterless camera (right) makes exposures at the rate of 11 million a second on two feet of 16-mm. film whirling inside a revolving drum. A series of side-by-side lenses gives multiple images. The slit picks up a different slice from each image, crowding the whole picture into an area as wide as the film but only 1/2,500 inch high. Narrowness of the slit acts like a focal-plane shutter and prevents blurring.





Slingshot Goes Modern

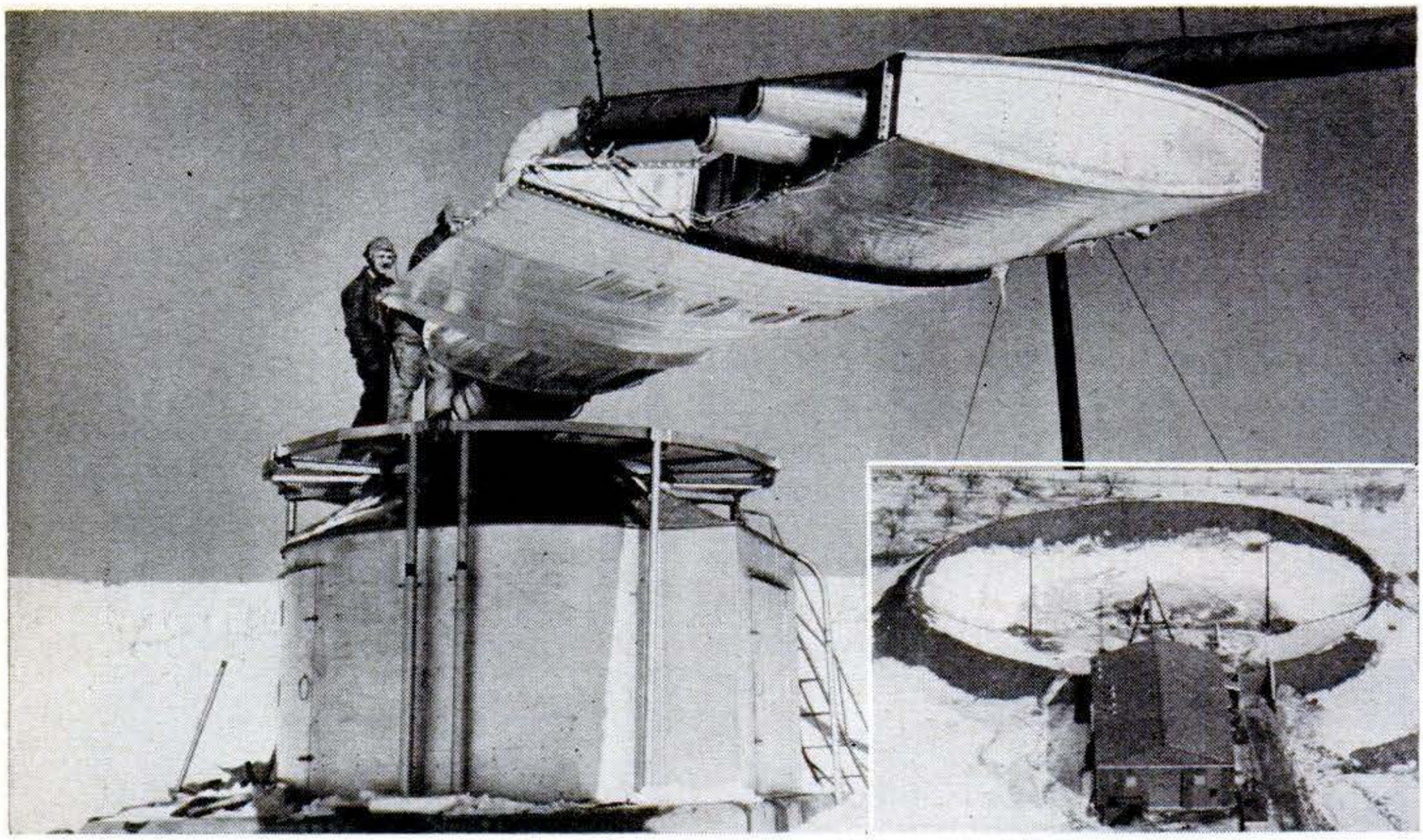
INTERESTED sportsmen can now obtain a streamlined, precision version of that ancient weapon and toy, the slingshot. Called the Catapull®, it has a light, aluminum frame, with a pistol grip, and heavy, live-rubber slings. The R.W. Hodge Co. makes it.



Makes More X Rays

MODERN styling and increased efficiency are combined in this new GE X-ray therapy machine. For use in the treatment of skin diseases, the compact, streamlined, pearl-colored unit more than triples the radiation per minute provided by earlier models.

Copyrighted material

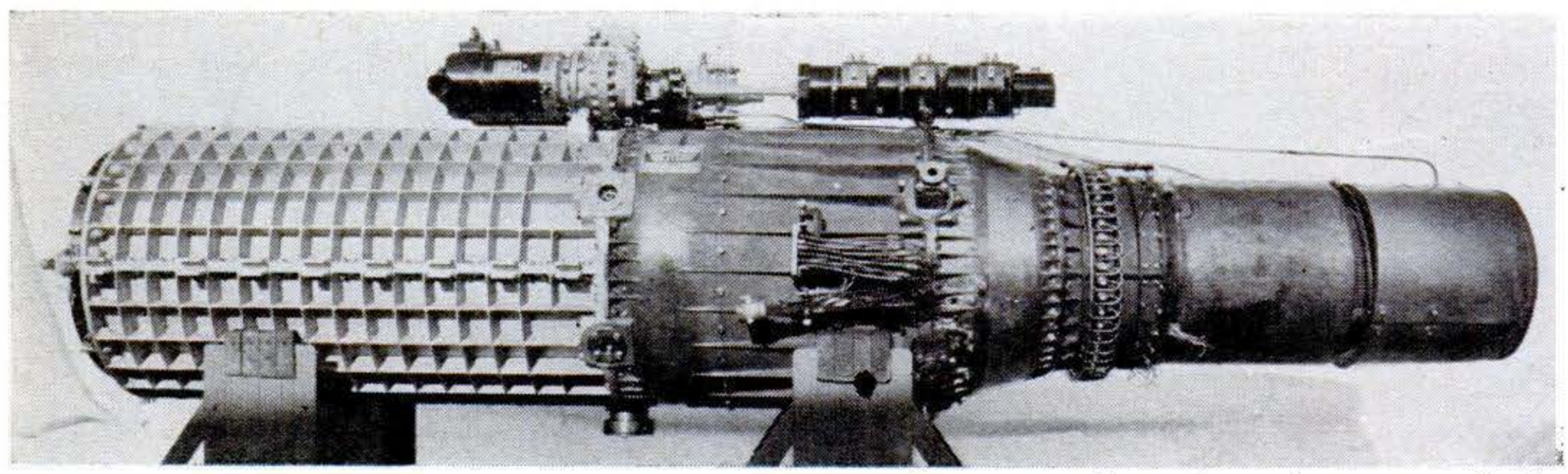


Egg-Beaters Try Jet

JET propulsion for helicopters is getting a trial run in the bowl-shaped, outdoor test pit shown in the inset above, a part of GE's Schenectady, N. Y., Flight Test Center. With developmental jet units at its tip, a helicopter blade is whirled around a turret pivot located in the center of the pit.

For drag studies, when the blade-tip jet units are not operating, a 1,000-hp. electric motor drives the blade. With the jet burners operating under their own power, the spinning blade converts the motor to a generator, whose output measures thrust.

The large steel building adjoining the pit contains laboratory facilities, a workshop, and controls for operating the outdoor propelling mechanism. An observation room has three-foot-thick concrete walls to protect engineers during runs of the rapidly whirling jet helicopter blade.



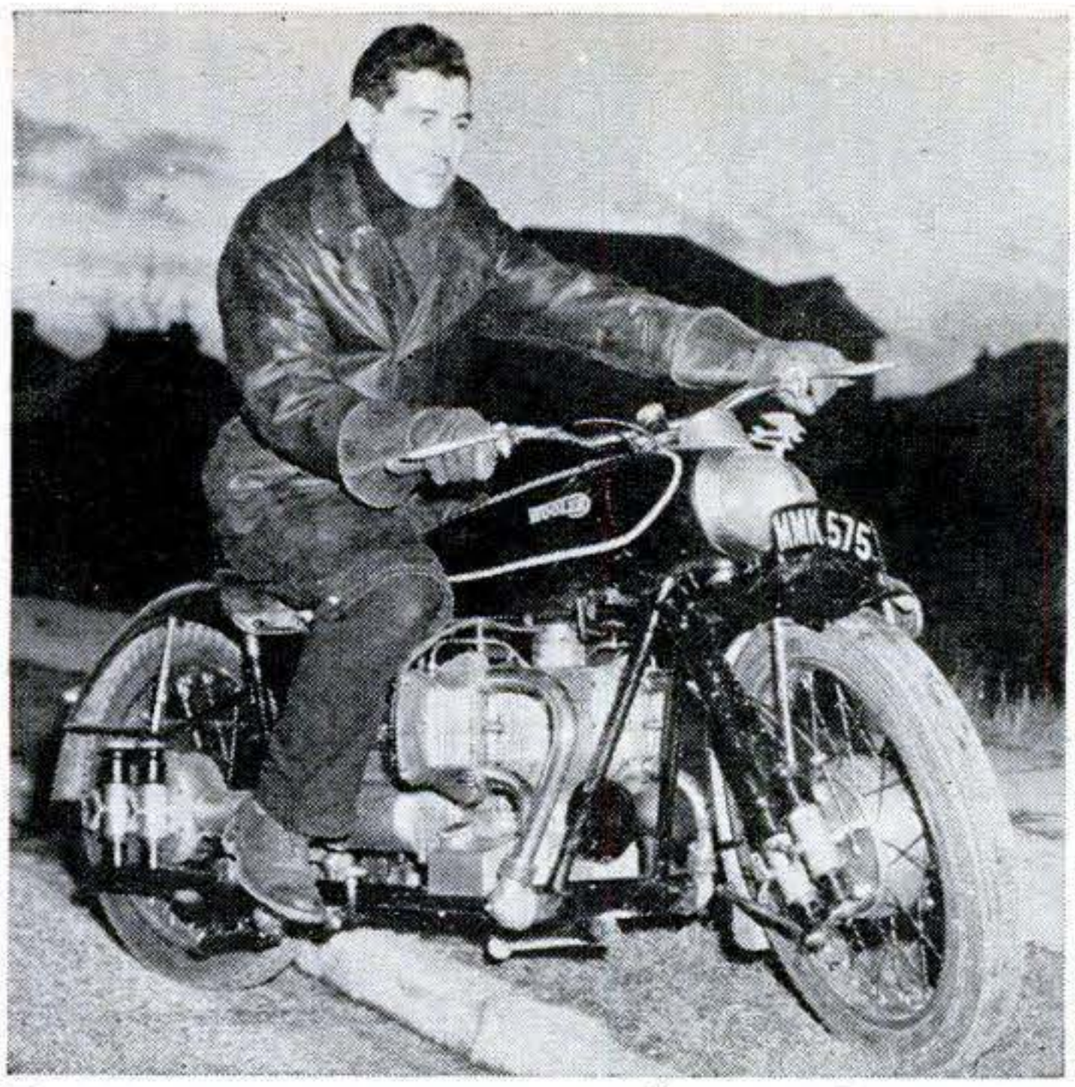
More Power, Less Fuel

THIS radical turbojet may lick the bugaboo of jet aircraft—high fuel consumption that limits their range. Thermal efficiency of the new XJ-37 is reported so great that it will enable fast jet bombers and fighters to fly as far as current reciprocating-engine types. Present jets have less than one-fourth the range of their slower rivals.

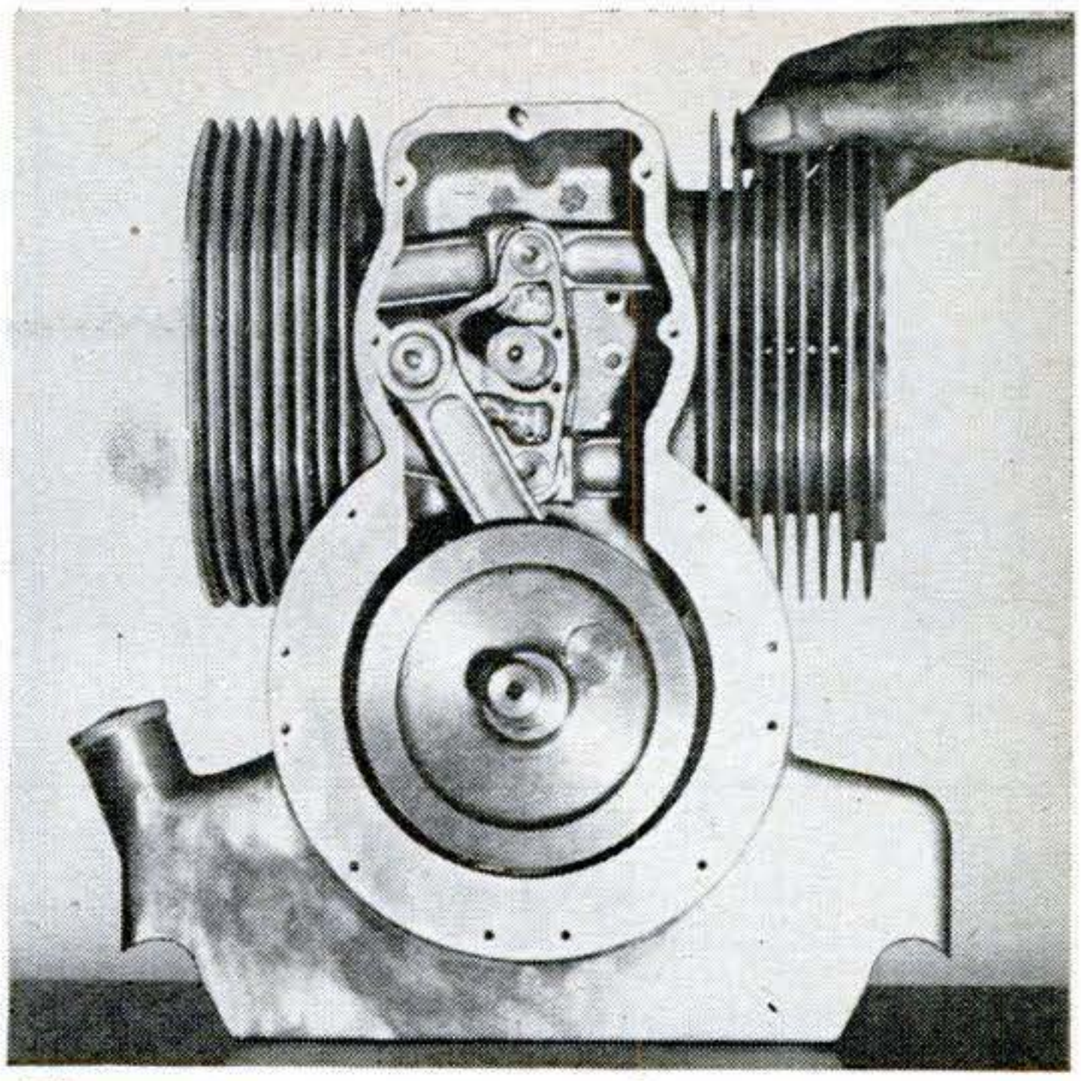
Designed by Lockheed, the XJ-37 packs the 8,000 hp. of a Diesel railroad engine into a package weighing less than one of the locomotive's drive wheels. Its small frontal area permits the jet to fit into either wings or fuselage with a minimum of drag of nacelles or intake ducts. It can be used either as a pure jet engine or in a turbine-propeller combination.

To speed completion, final development and testing of the engine is being carried out at the new turbine-research laboratory of the Wright Aeronautical Corp., Wood-Ridge, N. J. (PS, Jan. '48, p. 142).

Copyrighted material



To demonstrate its easy riding qualities, the Wooler was driven up and down a 6" curb at 15 m.p.h. The spring frame of the machine absorbed most shocks. Steering remained steady.



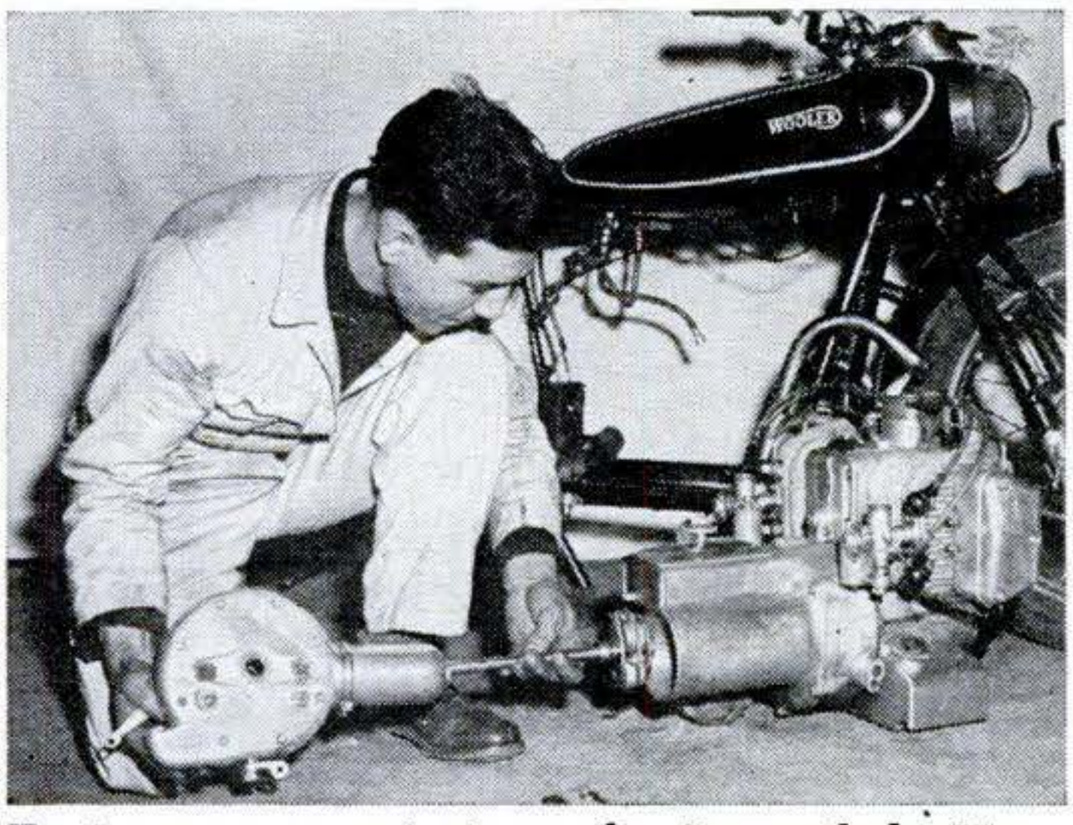
The master connecting rod moves in an arc at its smaller end. This causes the rocker beam to rock around its central pivot. Four smaller con rods are linked to the ends of the beam.

British Cycle Has Rocker-Beam Engine

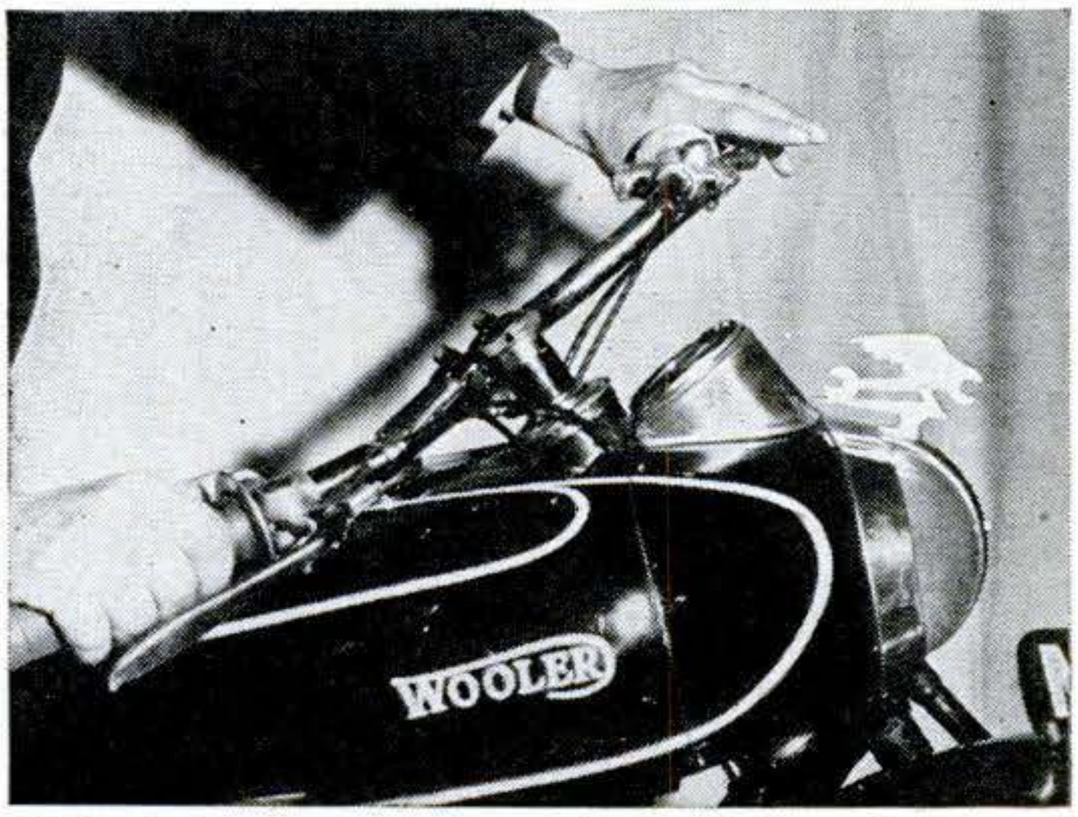
THE rocking-beam principle, familiar in old steamboats, is applied in the four-cylinder engine of the Wooler, a British motorcycle. In the photo at upper right, four connecting rods may be seen attached to the top and bottom ends of the triangular rocking beam, while the small end of the master connecting rod joins at an extension to the left of the beam pivot. As the rods move the beam, they deviate only slightly from a horizontal path.

For its 5-hp., 30.50 cu. in. engine, this motorcycle is comparatively light at 230 pounds. The oil tank is integral with the crankcase, so that the entire oil supply assists in crankcase cooling. In the photo at right above, the oil tank filler is at the lower left. Ignition and lighting are by a 46-watt, 12-volt generator, with a 2-volt battery for parking lights.

Designed for simplicity of servicing, the cycle may be taken apart by the use of only two wrenches, no screwdriver being necessary. The engine and transmission, together with the shaft drive and the rear wheel, can be removed from the frame in six minutes.



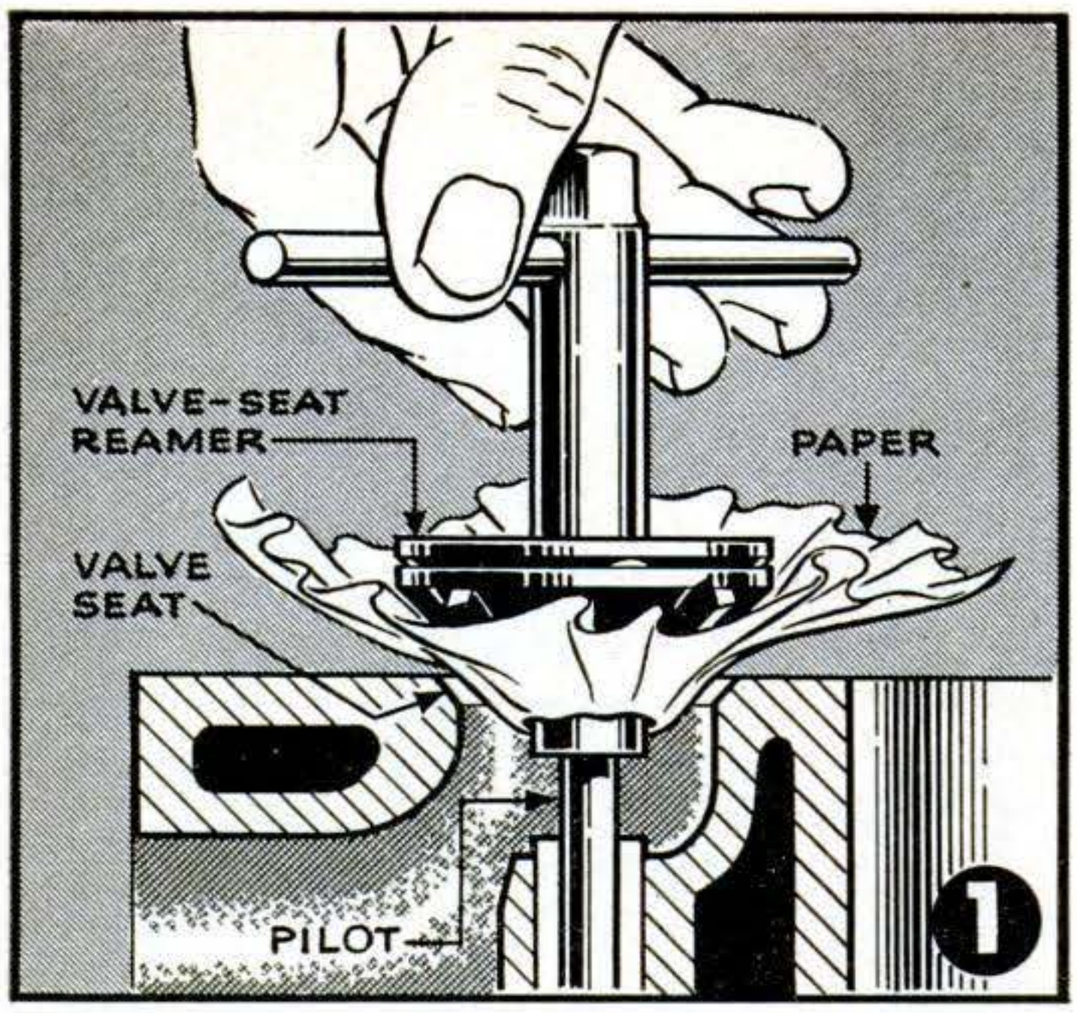
Entire power train is easily dismantled. Here engine, gear box, and shaft drive are removed.



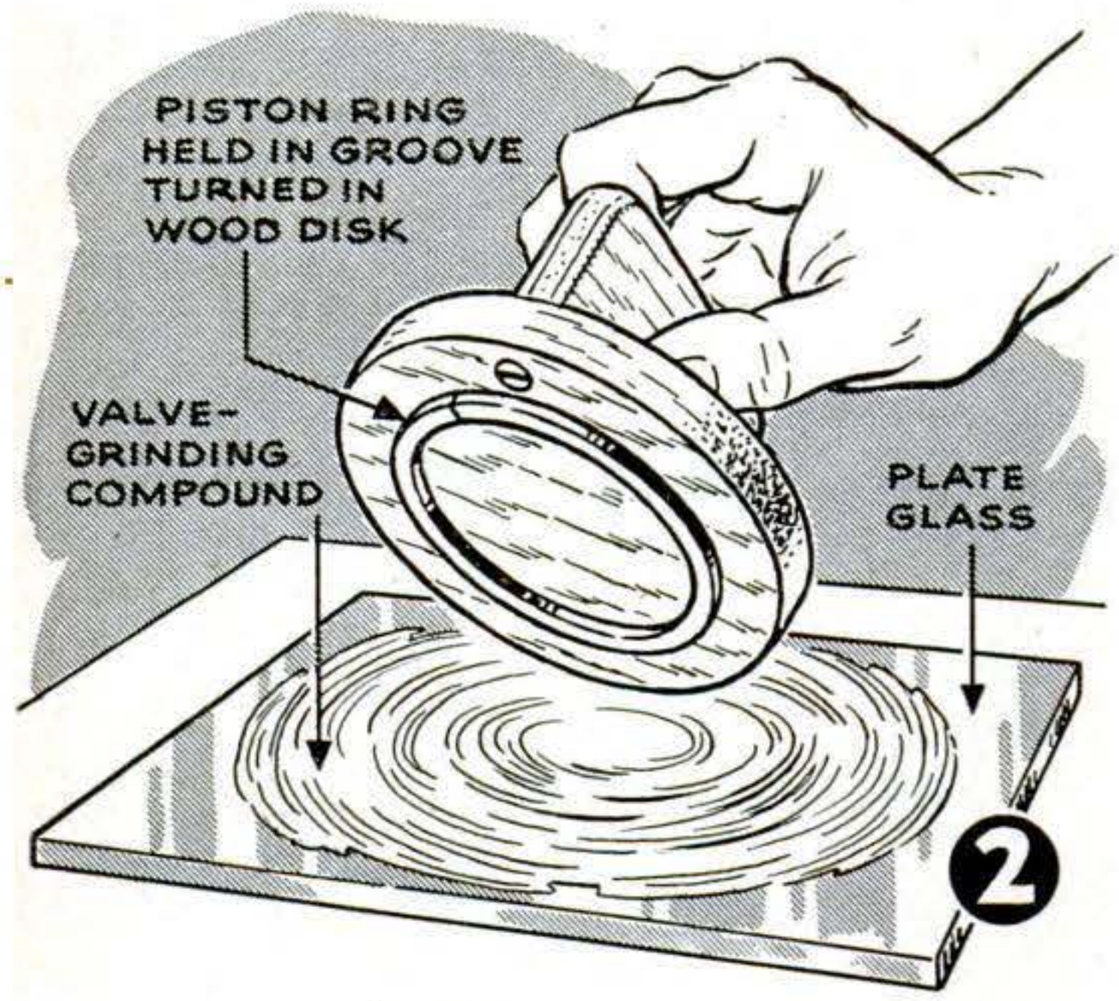
Faired into the gas tank, both headlight and speedometer differ from conventional design.

Copyrighted material

Hints From the



1. Stopping Chatter. If you have to ream a valve seat by hand, here's a trick that has been useful in the Model Garage. Slip a piece of thin paper over the pilot and ream right through it with short, quick turns. This will prevent the vertical ridges or chatter marks that sometimes ruin jobs of this kind.

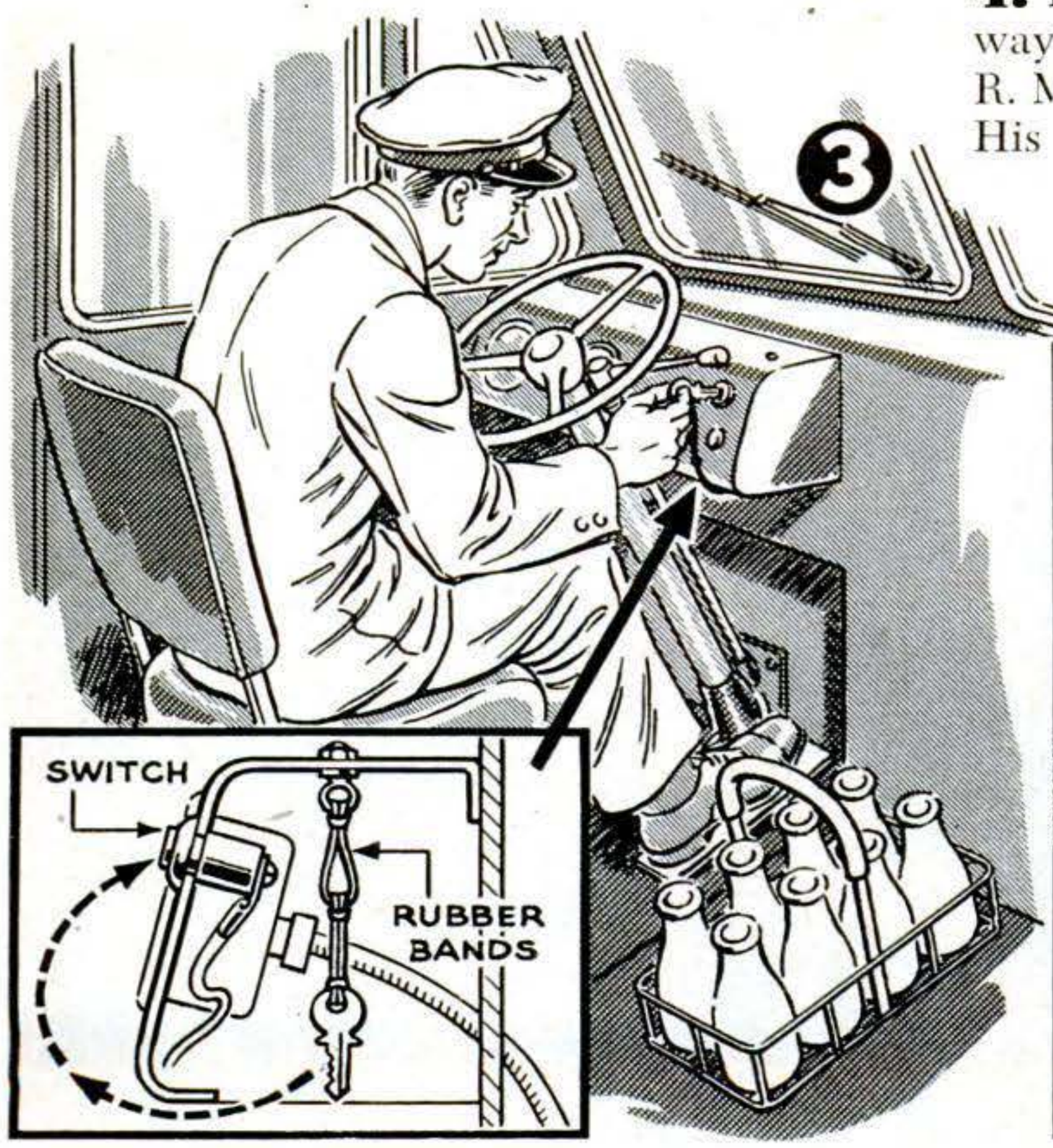


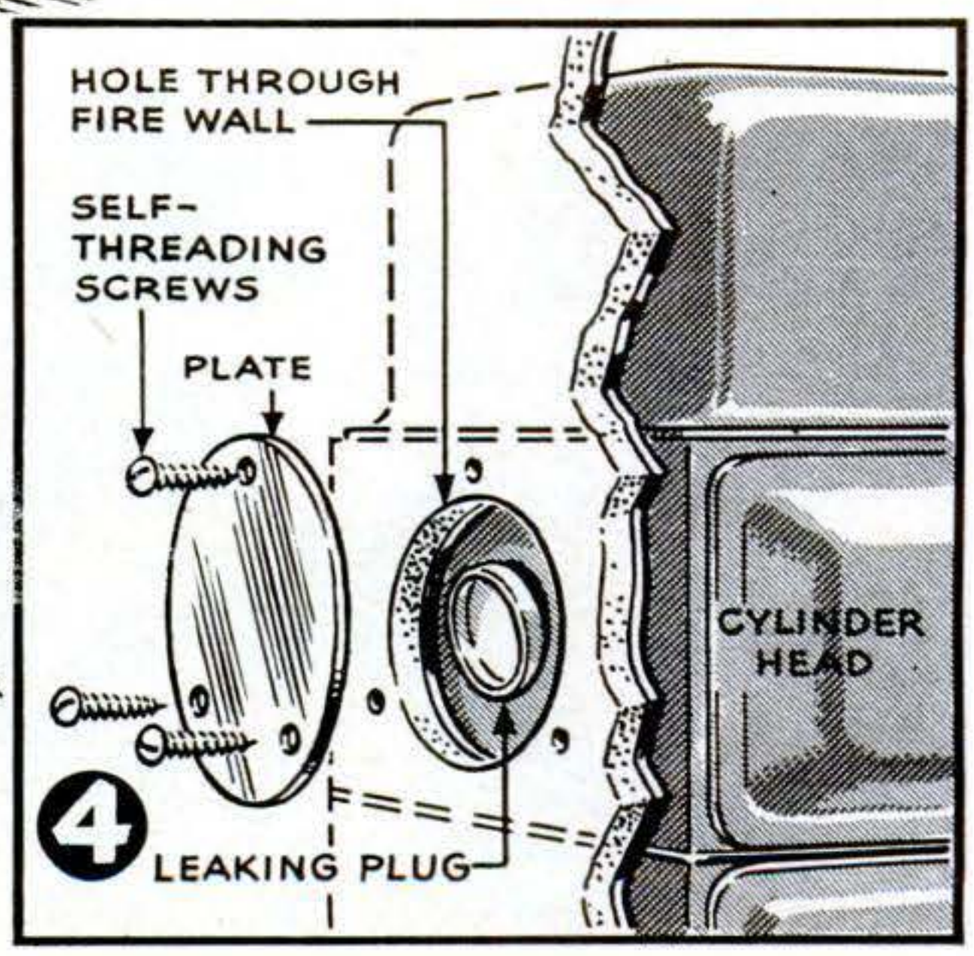
2. Ring Sized in Jig. Piston rings that are oversize in width can be ground with this jig. Saw out the disk and turn a groove in which the compressed ring will partially fit.

3. Ignition Key Hidden. A milkman must often go out of sight of his truck while making deliveries. Rather than invite theft, one driver pocketed his ignition key each time that he left. But it was always a nuisance to fish around for the key when he returned. He has now solved the problem by fastening the key behind the instrument panel with a rubber band. This keeps it hidden, but always at hand.

4. He Kept His Head On. An easy way of doing a tough job was found by R. M. Jackson, Jr., of Patuxent River, Md. His 1941 Buick developed a leak in the

Drawings by Stewart Rouse





Copyrighted material

Model Garage

freeze-out plug at the back of the head. The repair job threatened to be long and costly, because the closeness of the fire wall seemingly meant that the head had to be removed. Instead, he cut a hole in the fire wall and had the job done in minutes. A plate closed the hole.

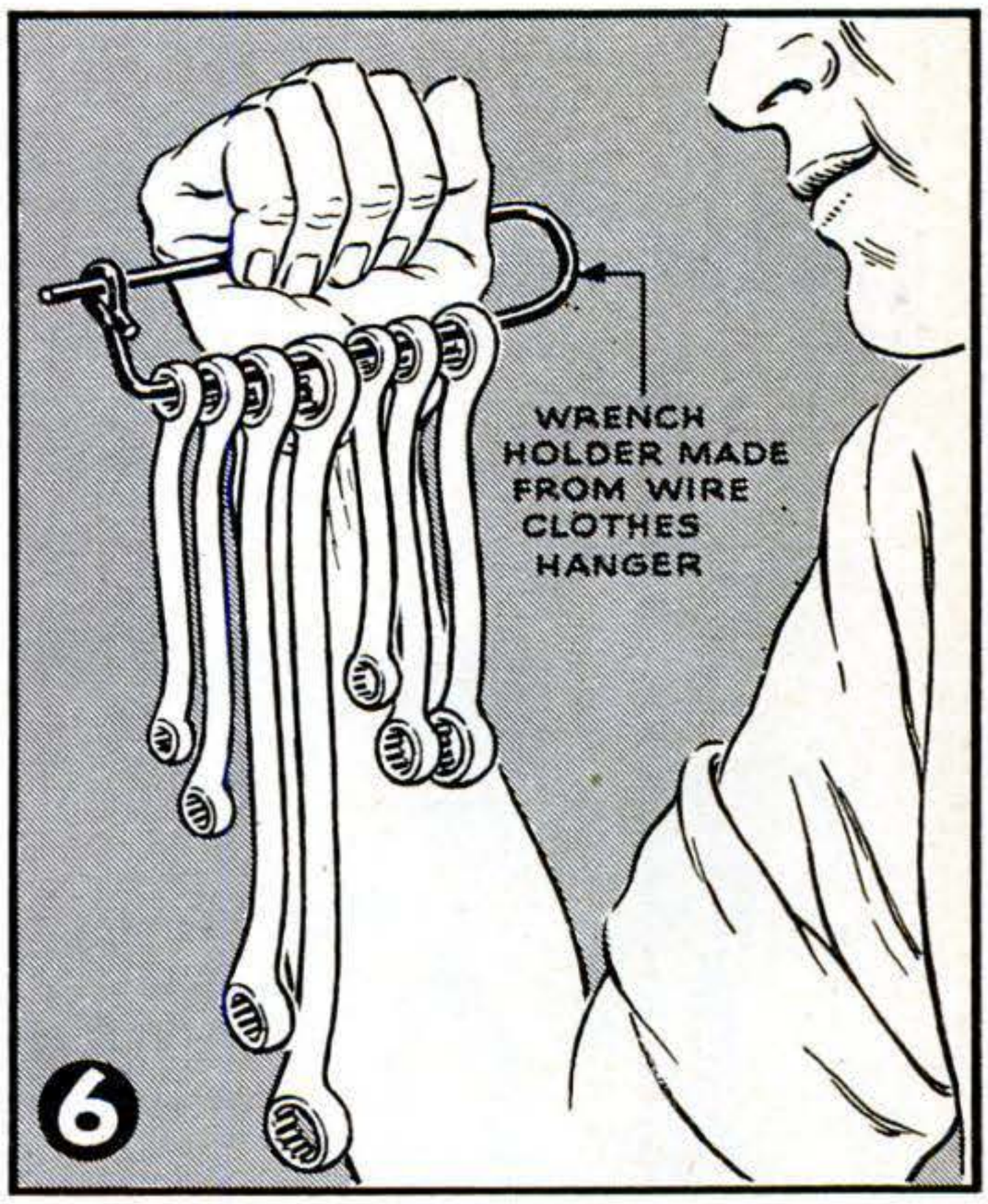
5. Getting Back Lost Plates. Erich Dallmer, of Narrowsburg, N. Y., suggests painting your name and address on the back of each license plate. It's a fine idea, and costs less than a replacement.

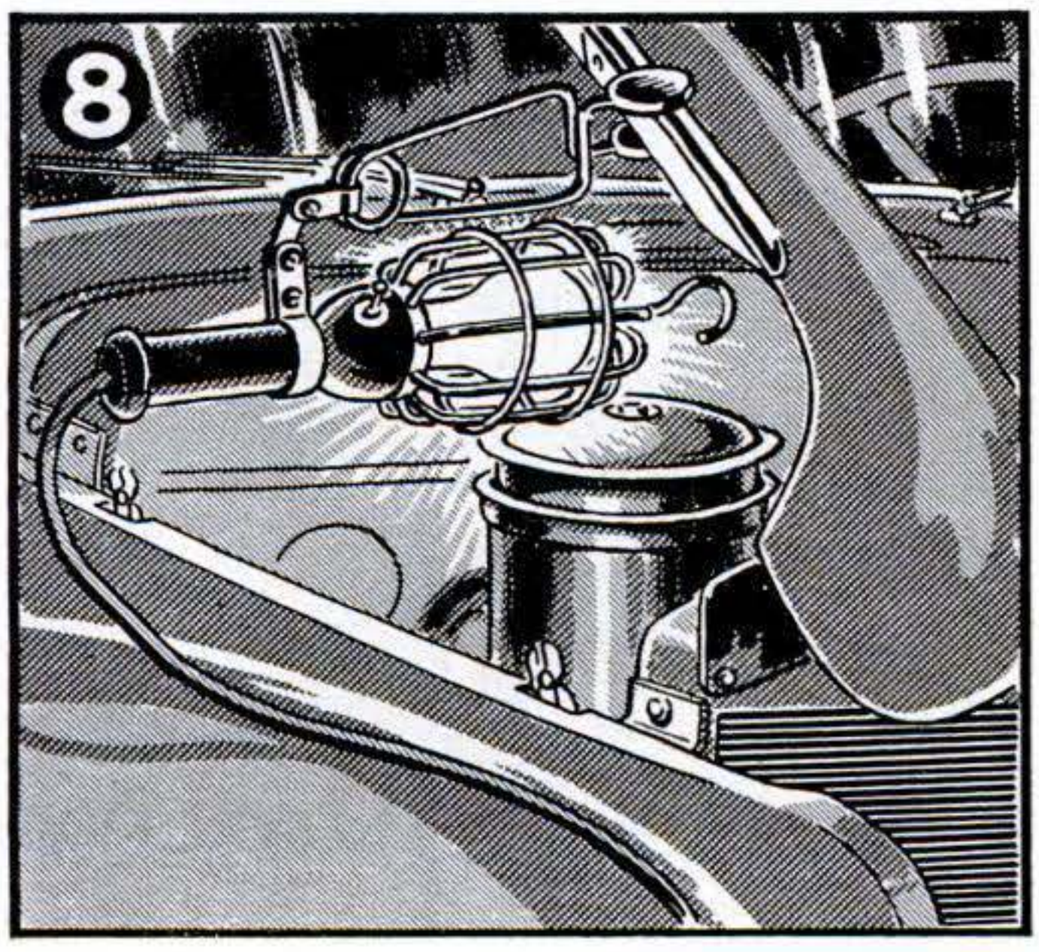
6. Wrenches Kept Together. Tired of hunting through his tool case for a needed box wrench, Arthur E. Nordhoff, of Seattle, made a large "safety pin" from a clothes hanger. This keeps them all at hand.

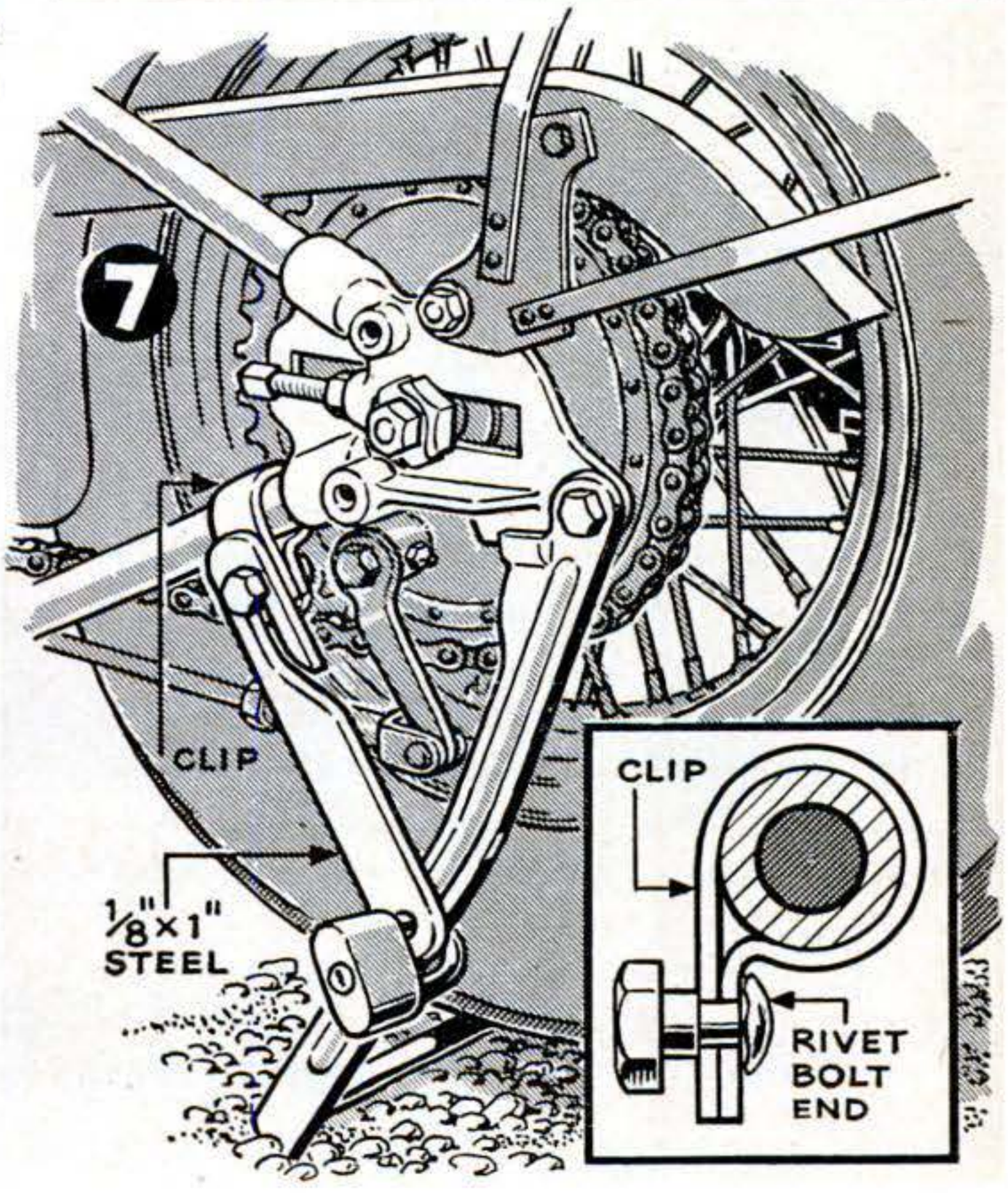
7. Lock Protects Motorcyle. This rig, writes Ivan J. Stretten, of Detroit, will both lock a motorcycle and prevent it from rolling off the stand. The slot in the arm lets you stow the arm in the tool box when it's not in use.

8. Clamp Added to Light. A spring clamp of the kind used on photographic lights lets you clip a trouble-shooting lamp in practically any desired position. H. Zave, of Chicago, makes the suggestion.

Gus Wilson







Copyrighted material

"I heard you checking for all the usual troubles, so I concentrated on the unusual. If you hadn't checked first, I would have had to."

Gus Troubleshoots by Ear

By Martin Bunn

"AFTER all," Joe Clark insisted, "this Model Garage is a business. We ought to conduct it like one!"

Gus Wilson grinned at his go-getter partner. "We're not running it exactly like a church bazaar," he commented. "I thought we weren't doing so badly."

Joe's sharp eyes gleamed behind his horn-rimmed specs. "We're not doing so badly," he snapped, "but we could be doing a lot better. We've invested in first-class equipment that enables us to do almost any job and keeps our costs in line. But you're forever turning down jobs because we can't get them done in time. Inefficient! That's what it is!"

"You sound like an after-dinner speech at the Junior Chamber of Commerce," Gus scoffed. "All right—what'll you have?"

Joe pointed out the office window at Stan Hicks, who was hosing down the driveway. "You've developed that kid into a good mechanic. You told me so when we gave him a raise, but you're still wasting his time on grease-monkey jobs."

Gus felt relieved. Joe wasn't trying to palm off a new mechanic on him. "Promote Stan to a regular mechanic's job and get a new grease monkey—that your idea?"

"That's my idea."

"Well," Gus said, "let me think it over."

He went back to the job he had left on his bench. After a while he heard Stan come into the shop. "Looking for something to do, kid? You might start—" Glancing up, he saw that his helper's face was

Copyrighted material

Copyrighted material

flushed a fiery red. "What's the matter with you?" Gus demanded.

"I—I—I ain't asked you a question for two weeks!" Stan blurted.

Gus laughed. "Swell. Keep it up!"

"Lookit, boss—what I mean is I don't have to ask questions any more—not so many, anyway."

"I get it. You know all the answers."

"Aw, boss—you know I don't mean that," Stan protested in an outraged voice. "What I mean is, you oughtn't to make me go on doin' boy's work. It ain't only that I ought to be earning the raise you gave me," Stan stumbled on. "It's the—the—"

"It's the principle of the thing!" Gus finished for him, with a grin. He gave Stan a resounding smack on the shoulder. "Maybe you're right—I'll talk to Joe about it." He cut short Stan's delighted thanks by jerking a thumb toward the shop door. "Better open up—someone wants in."

THE limousine that rolled slowly into the shop was big, somberly plutocratic, and obviously new. A chauffeur slid from behind the wheel and held open the door. Out stepped a fat man attired in a Prince Albert, striped pants, and a broad-brimmed fawn-colored felt hat.

"Morning, Senator," Gus greeted him.

Senator Bombey grunted, fished a large cigar out of his pocket, and extended it to Gus.

"Thanks—never use 'em," Gus declined.

The Senator looked Stan over. "Vote yet, boy?" he asked.

Stan blushed scarlet. "No—no, sir," he stammered. "Not until next year."

It's *this* year that Senator Bombey has to run for another term. He grunted again and thriftily returned the cigar to his pocket. Then he jerked his chins toward his car. "Who invented 'em?" he demanded.

"Automobiles?" Gus said. "Some people give the credit to Duryea, and some give it to Selden."

"Credit!" the Senator snorted. "Undependable things! This car has been driven only—how far, Jackson?"

"Fifteen hunnert'n six miles, suh."

". . . has been driven only one thousand five hundred and six miles," resumed the Senator, who never makes a statement in four words if he can make it in a dozen, "and it has a knock. Listen."

Gus listened. From somewhere under the limousine's sleek hood came a half muffled, rapid click. "Speed her up," he directed. Jackson did. The click, still regular, became more rapid.

"Engine's knocking, all right," he said. "If you want to leave your car, I'll—"

"Time," the Senator pronounced, "is of the essence. I must drive to the National Capital today. Vital legislation is impending. My chauffeur will return for my car at two o'clock. I trust that you will make every effort to have it in first-class condition at that time." He held out a fat hand to Gus. "Good-by, Mr. Wilson. Remember, when you go to your voting place to exercise the free American citizen's proudest privilege, that 'Bombey Serves the People!' . . . Jackson, get me a cab."

He went out. "Windbag," Gus laughed.

But Stan was impressed. He stared at the limousine, feeling that he was playing a part in important events. Senator Bombey had to get to Washington, and he would help him do it, and at the same time prove to Gus that he had what it takes when the chips are down.

"Want me to take care of this job?" he asked with faked carelessness.

"Sure—go ahead," Gus told him placidly.

FOR a full five minutes Stan, his youthful and grease-smeared face reflecting intense mental effort, regarded the Senator's car. Gus didn't have to watch Stan to know how he was going about the job of trouble-shooting—his trained and experienced ears told him. He nodded approval when he saw Stan checking the valves with a feeler gauge—a worn valve stem guide or too much tappet clearance causes most clicking noises in auto engines. But this time the valves didn't seem to be at fault, for Gus heard Stan get a sounding rod and start using it in an effort to locate the noise. "The kid's showing good sense," he thought. "That click *could* be caused by a broken piston ring, or maybe a loose piston or a bad crankshaft bearing—but I don't think it is."

Apparently it wasn't, because for the next hour he listened to Stan trying one thing after another. He grinned broadly when he heard a tool being slammed down. Gus knew that licked feeling!

"Guess I'll get my lunch," Stan said.

"Okay, kid."

When he was sure that Stan was out of the shop, Gus started the engine of Bombey's car and listened intently. The muffled, regular click speeded up—became almost a

Copyrighted material

steady noise—as he pulled out the hand throttle.

Gus scratched his head reflectively. Then he throttled back to idling speed, picked up a sounding rod, and, with his ear close to its upper end applied it to various parts of the engine. "Sounds like the crankshaft," he muttered after a couple of minutes, "but it couldn't—now, I wonder!"

Almost as the thought crossed his mind, he reached in and retracted the oil dipstick about an inch. Instantly the clicking stopped. With a broad grin on his face, Gus switched off the ignition, removed the oil stick, wiped it clean, and examined it carefully. "It would be a dirty trick," he mused with a chuckle, "but I'd like to see what he does . . ."

Laughing, he made his way to the back of the shop and scanned the old engines lying about there. Two were of the same make as Senator Bombey's limousine. Gus quickly pulled the dipstick out of the newer of the two relics and compared it with the one he held in his hand. Close examination showed that in this respect, at least, the engines hadn't changed. Wiping it clean, he carried the rod back and inserted it in the limousine. Then he started the engine. It purred almost noiselessly, and without any click.

Gus laughed again and went down to the Park House for his lunch.

WHEN he got back, Stan promptly announced: "The Senator's bus is ready."

"Good!" Gus said. "So you got rid of the knock. What was causing it?"

"I couldn't find out, boss," Stan admitted unwillingly but honestly, "but it ain't there anymore."

"That's queer," Gus said. "I'll take a look —say, will you get me another screw like this from the stockroom?"

As the door closed behind his helper, Gus hurried over to Bombey's car, took out the dipstick, and replaced it with the original. When Stan came back he was busy at his bench.

"Thanks," Gus said. "Now I'll check that engine."

He started it. Stan's eyes popped and his jaw sagged. The half-muffled click was there again.

"Didn't you say you'd got rid of it?" asked Gus reproachfully.

"It wasn't there when I came back from lunch—honest it wasn't!" Stan wailed. "I ought to have asked you to help me, boss. I'm a heck of a mechanic!"

Gus gave him a poke in the ribs. "That's so," he said, "but you're the only mechanic we've got."

Amazement spread on Stan's face. "What do you—? I mean—that is, I am a mechanic, kind of, only—"

"You're promoted."

"But, boss!" Stan pointed at the Senator's car. "After what I did—?"

"Oh," said Gus soothingly, "you didn't do too badly. That's just one of those things that can happen to anyone around here." Gus chuckled and poked his assistant on the shoulder. "You did everything except fix the bus, and there's no need to cut your throat over that."

"Maybe not, but what are we going to do about it?"

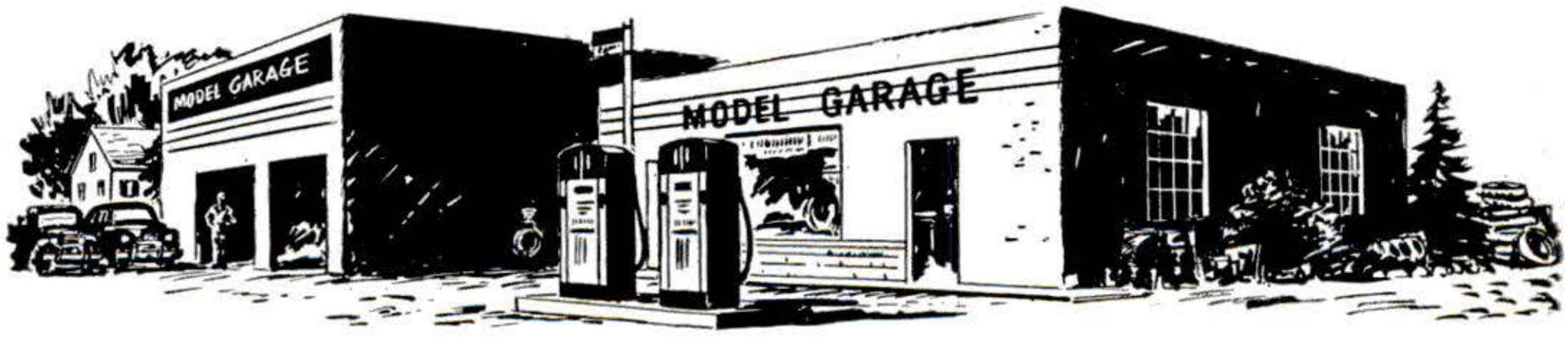
"Fix it, quick," Gus told him. He stopped the engine, pulled out the original oil stick, and replaced it with its duplicate. "Try her now."

Stan did. The knock was gone. "I don't get it, boss," he said helplessly.

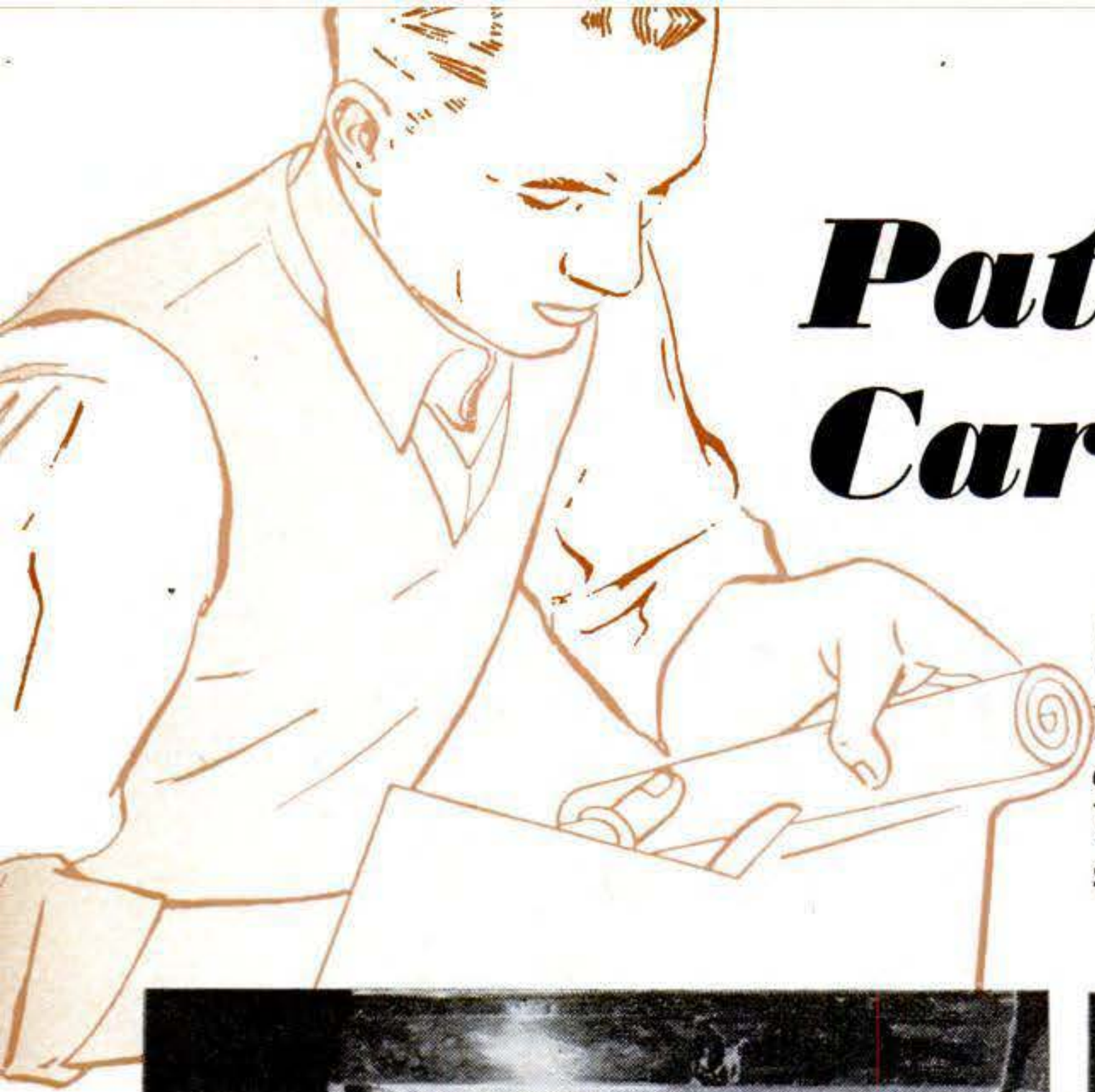
Gus handed him the dipstick. "Somebody bent this just a bit—stepped on it, maybe. Anyhow, the crankshaft hit it every turn."

Stan took the gadget, shaking his head. "I knock myself out making every test I can think of, and then you come and find the trouble right off."

"Sure," Gus laughed, "*because* you made the tests. I knew you'd looked for all the usual troubles, so I concentrated on the unusual. If you hadn't checked it, I would have had to. You wouldn't go looking for a needle in a haystack unless you've looked in the sewing box first!" **END**

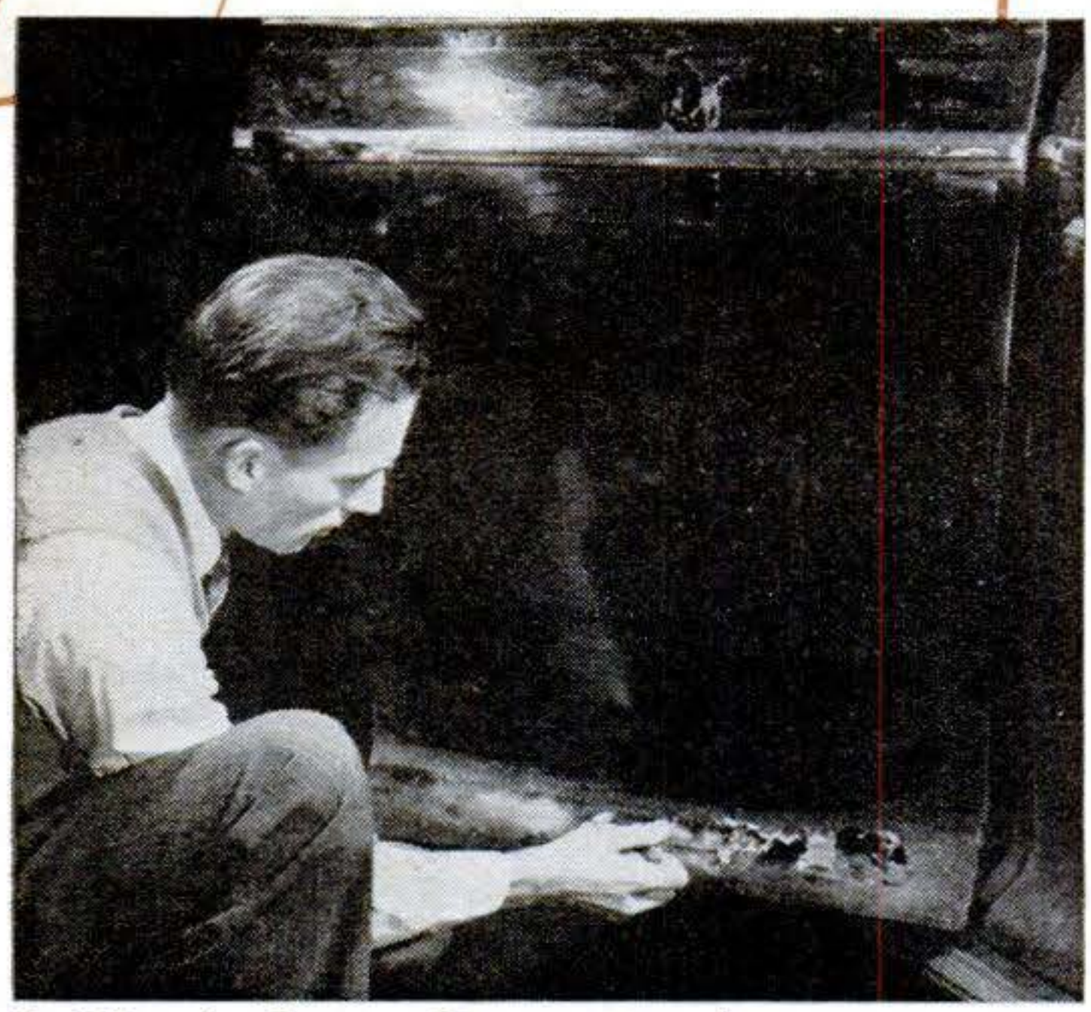


Copyrighted material

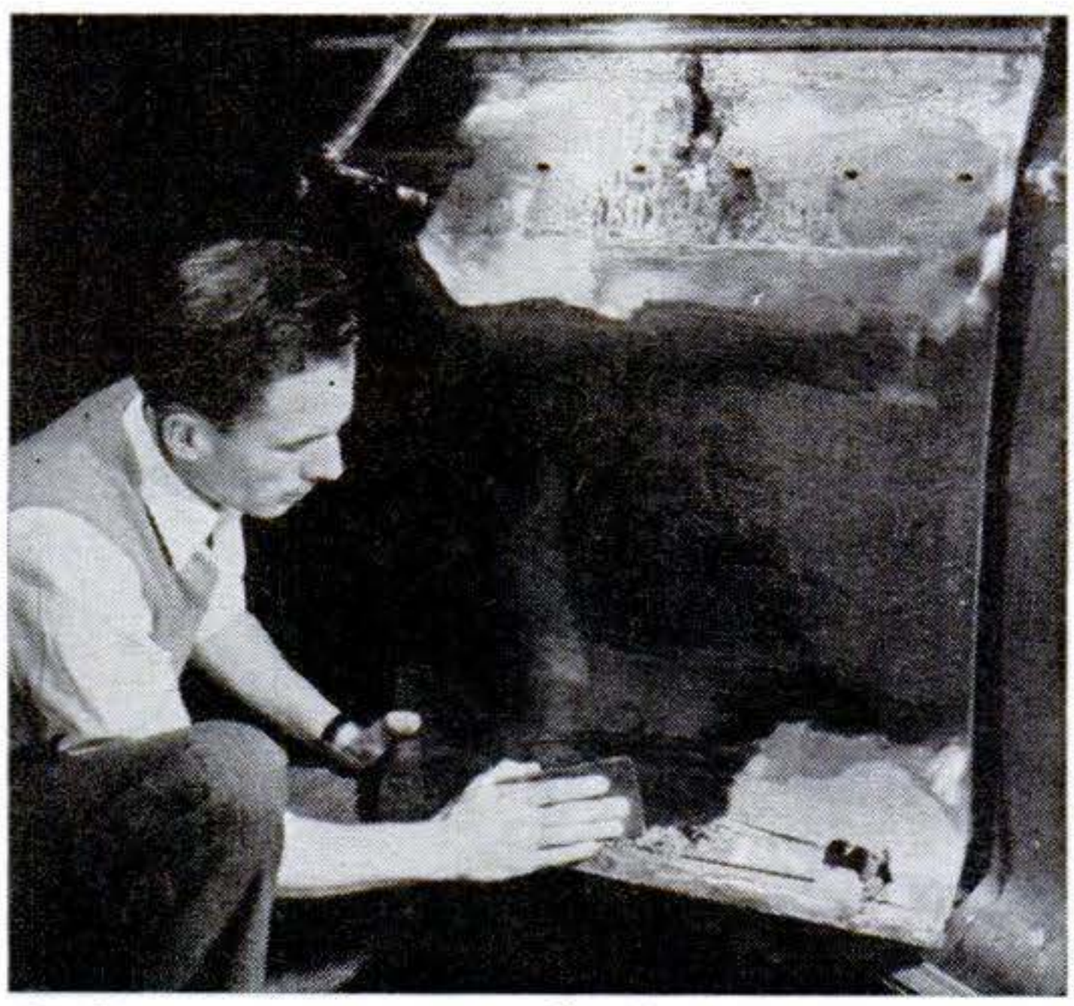


Patch Up Your Car with Cloth

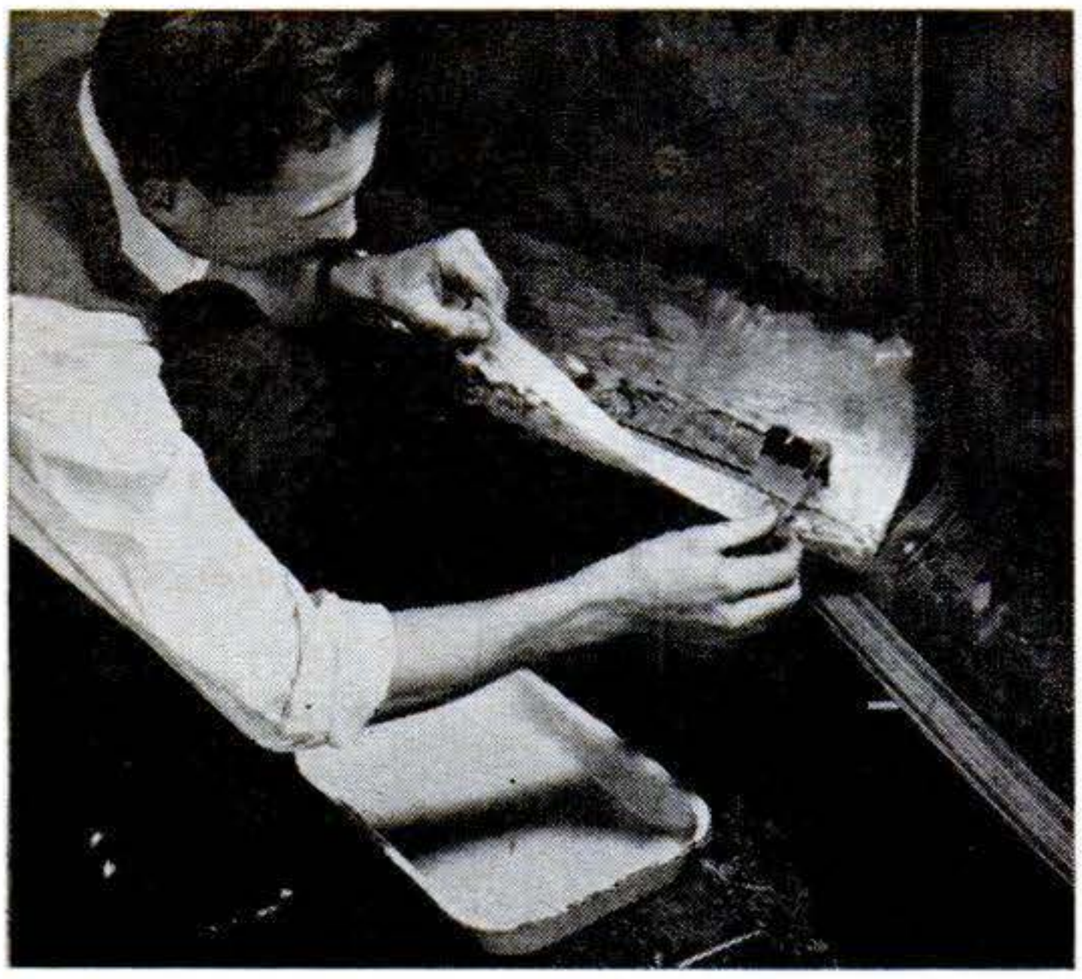
COTTON cloth impregnated with plastic offers an easy way to cover rusted or broken-metal areas in the fenders and body of your car. Already being used by a number of repair shops, the procedure is so simple that any handy man can do a good



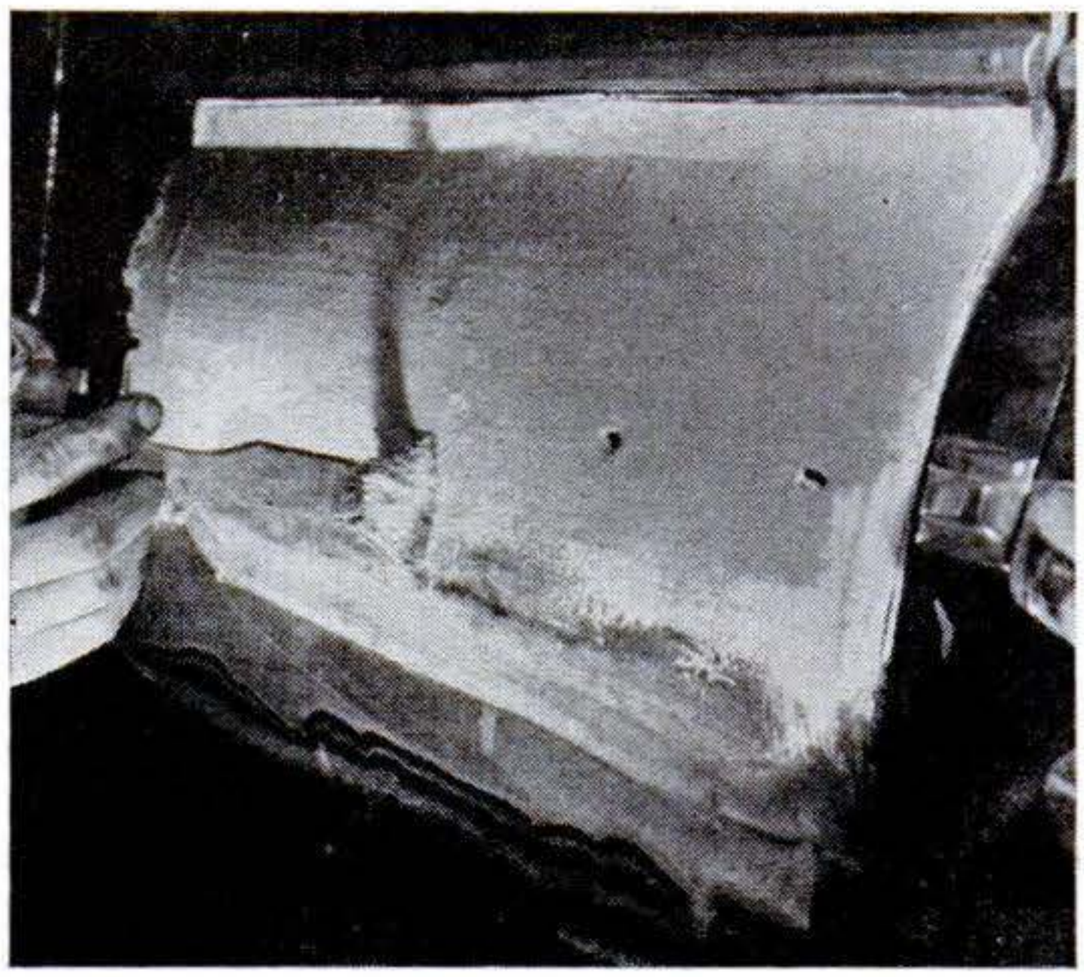
1. Here's the problem. Rust has eaten away the metal to such an extent that it breaks or you may poke a finger through it. This looks like a shop job—but you can do it yourself.



2. Scrape and sand off all the paint around the rust and clean down to the live metal. If the metal were broken or torn in a collision, you would start the repair job the same way.



5. Successive layers of Celastic Ⓣ may be used to build up spots where the original metal is completely gone. Allow each layer to set 15 to 30 minutes before applying the next one.



6. Brush metallic-base putty over the patch after feathering back the edges about 1½" with sandpaper or a power sander. Cut the putty to a thin paste. Allow it to dry several minutes.

Copyrighted material

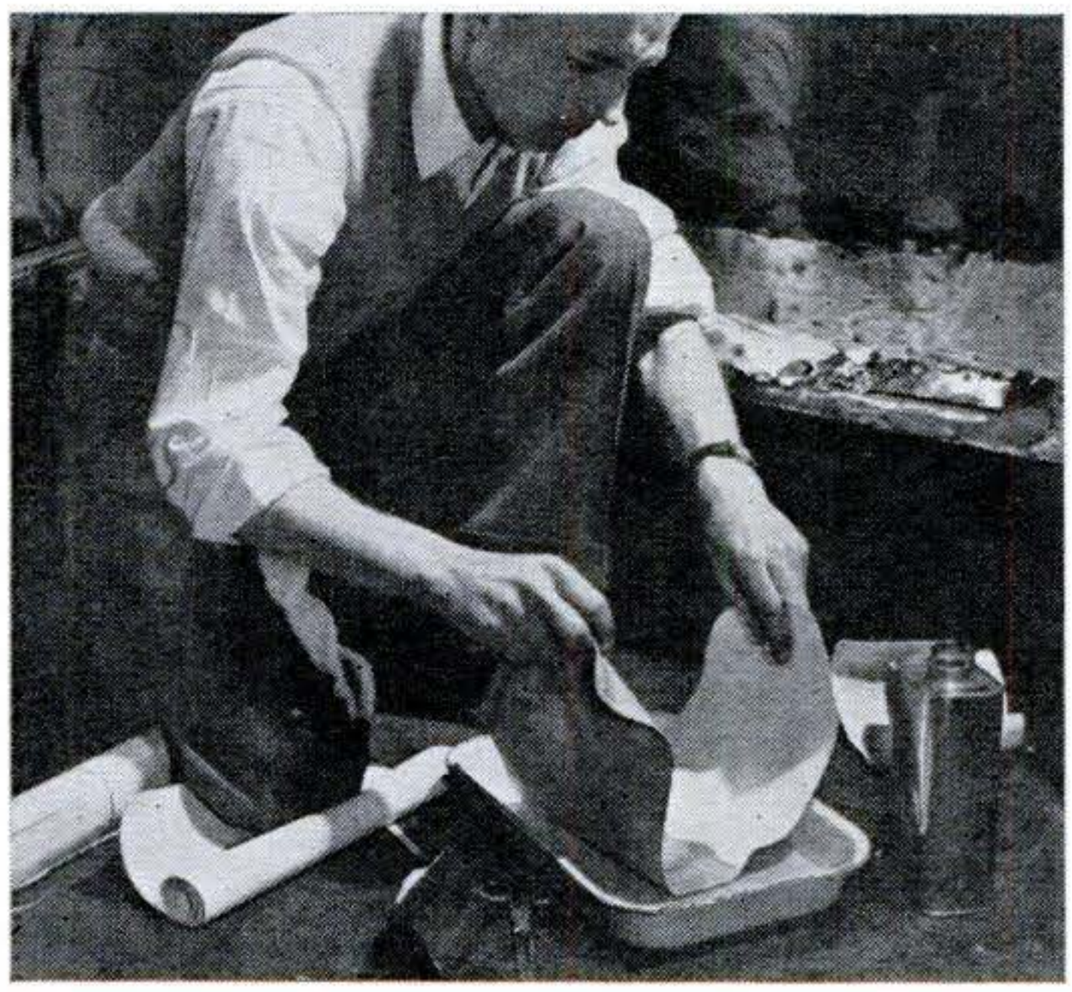
patching job at home. It also has the advantage of being inexpensive.

In the form that you buy it, the material looks and feels much like any closely woven fabric. You can roll it, crumple it, and cut it with a pair of scissors. But dipped into a solvent, the plastic-treated fabric becomes extremely rigid as it dries and will hold the form into which you mold it.

Three bonded layers of the material are said to have a tensile strength equal to the sheet metal on an ordinary car. It does not rot, rust, or mildew, and it's not affected by severe climatic conditions. When dipped into an acetone-base solvent, the plastic-impregnated material bonds itself to any surface that does not have a highly glazed finish. After it has set, you can coat it with a metallic-base putty, sand it down to a smooth surface, and apply paint or enamel.

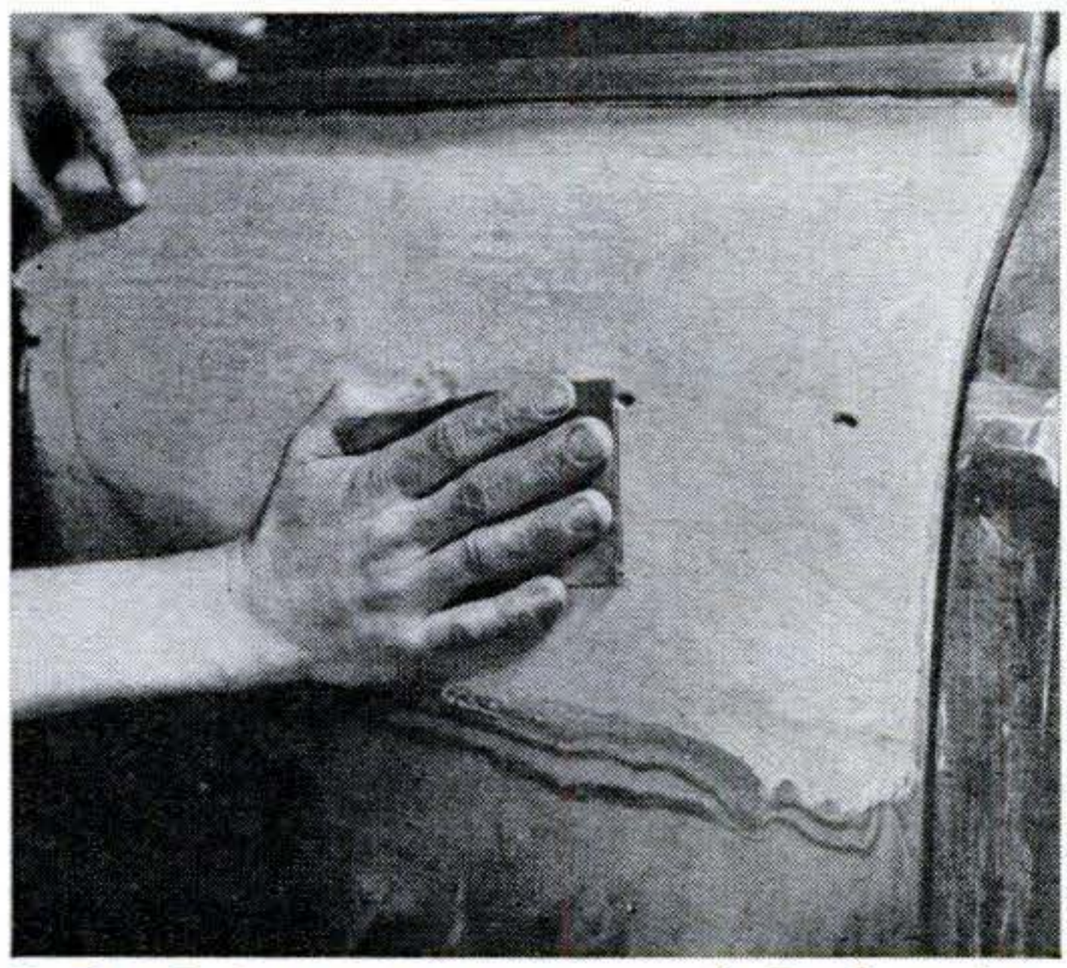
Called Celastic Ⓣ, the material was developed several years ago by **The Celastic Corporation**. During the war it was employed as an outer stiffener for self-sealing airplane fuel tanks. Since then, its characteristic of setting into a rigid form has brought it into use in a number of fields.

A. P. Deckert, of Buffalo, N. Y., distributes Celastic for use in the automotive trade. In addition to supplying repair shops, he

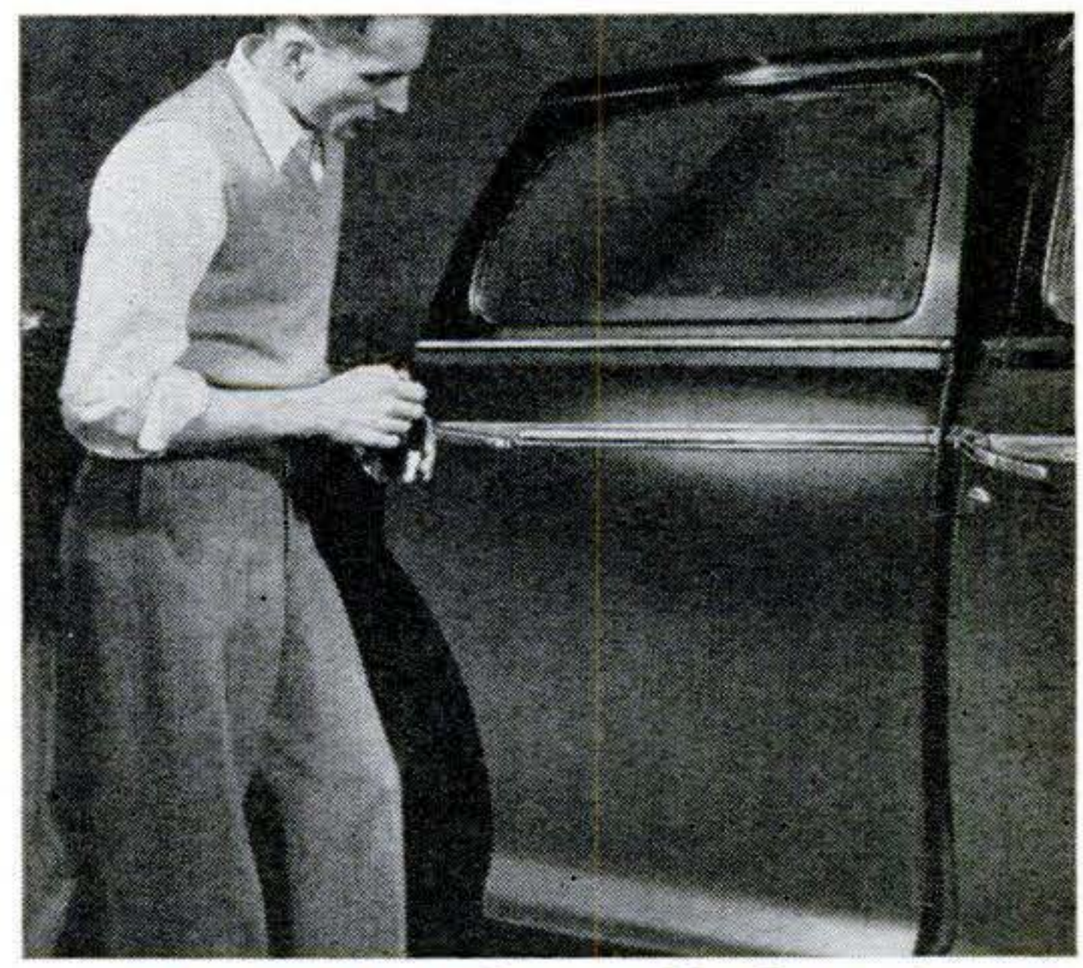


3. Cut a patch, allowing at least a 2" overlap, dip in solvent—but not longer than five seconds—and then whirl it in the air for a few seconds until the coating becomes tacky.

4. In applying, press the patch down firmly and mold to the original contour of the metal being replaced. Be careful to avoid pressure where there's no backing. Let it dry an hour.



7. Sand the putty to a smooth finish with a fairly fine paper (preferably No. 280). If the surface is still not as smooth as you'd like, apply a second putty coat and again sand it down.



8. Apply paint—and the job's done, this one in a matter of only two hours. If you work carefully, the area will look almost like new. The cost? Well, it's surprisingly low.

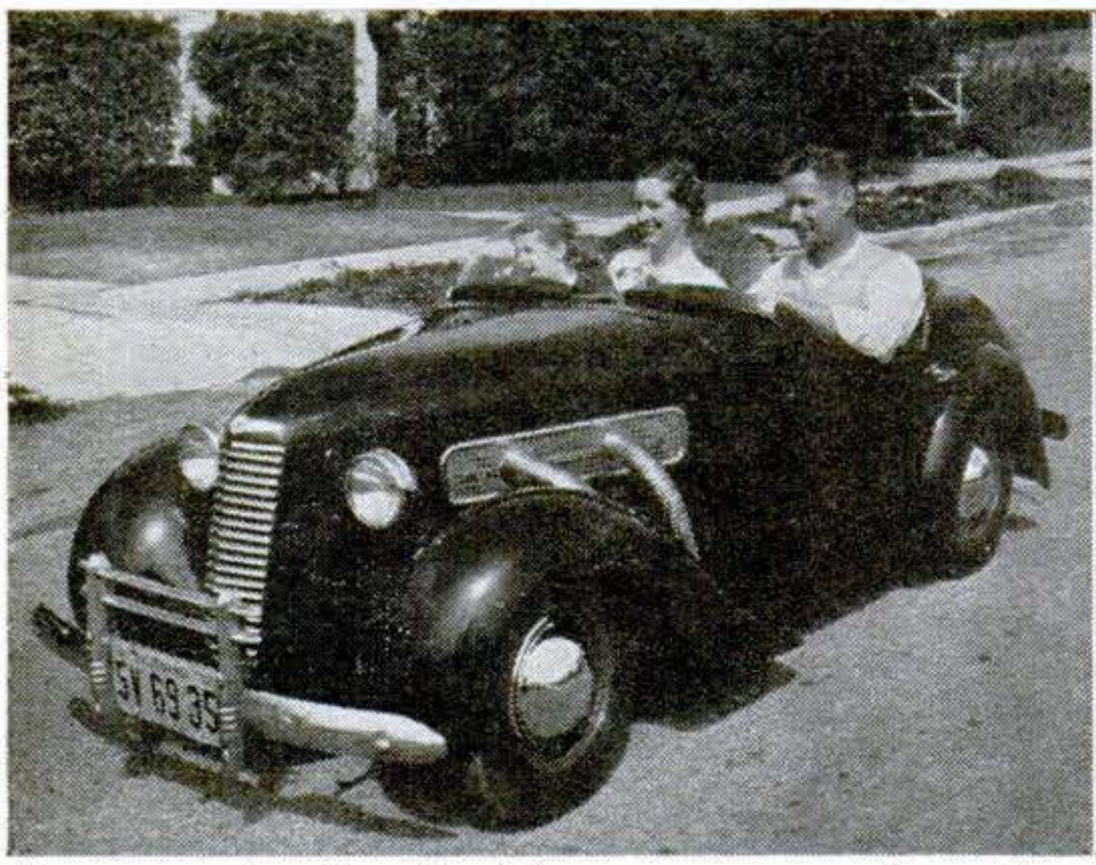
Copyrighted material

is considering inexpensive kits for home use which include three thicknesses of the material, a can of solvent, some metal putty and reducer, sandpaper, and directions for carrying out the job. The three weights of the material are: heavy, about 1/16″ thick; medium, 1/32″, and thin, 1/64″.

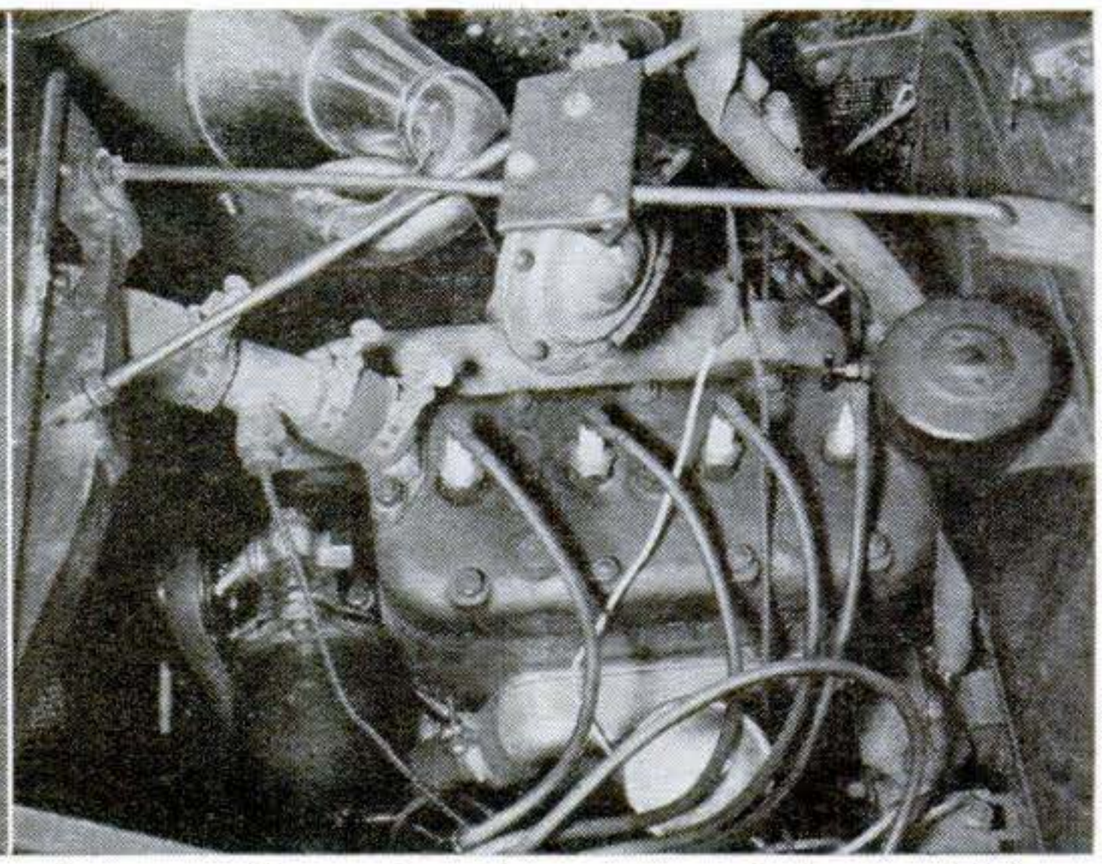
Body shops already have found Celastic both a time and money saver. For example, the job illustrated here took only two hours from start to finish, including a one-hour setting period for the patches, and the materials that were employed cost in the neighborhood of $1.50. Tests have shown that a patched area is practically as durable as a welded repair.

One automotive shop that has been using Celastic for body repairs also has found that it can be used to strengthen the sheet aluminum cabs supplied for Jeeps Ⓣ. Applied inside the cab, the material makes the aluminum much stiffer. END

As a stiffener, the fabric may be used in many ways. At the Crystal Collision Co., Brooklyn, it's applied inside aluminum cabs on Jeeps Ⓣ.



Everyone in the family can squeeze into the single seat. Notice the Nash grille at the front.

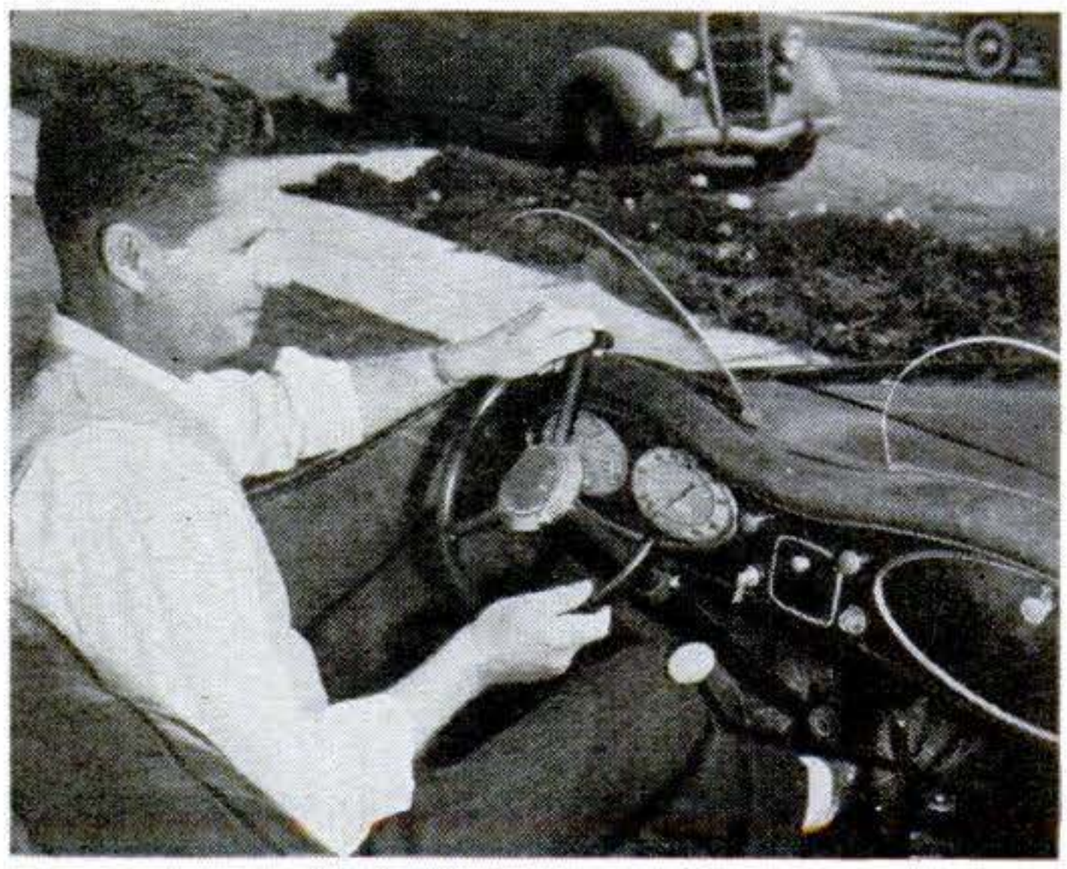


A souped-up Austin engine delivers 25 hp., and gives about 35 miles to a gallon of gasoline.

Homemade Midget Car Carries Three Persons

PARTS from a lot of different cars went into a midget auto that Harry B. Johnson, of Los Angeles, built in his spare time. Only 33″ high, it's wide enough to seat three persons with ease.

Both the chassis and engine are of American Austin manufacture. Frame and springs were lowered and midget racing-car tires installed. Plymouth instruments find service in the cockpit. Ford bumpers were cut down to suit, and a Nash grille was used. Fenders and body panels came from an Austin and Pontiac. False stacks decorate the hood.



The steering wheel is a plane-control wheel. Windshields were formed from clear plastic.

Copyrighted material

Mechanics and Handicraft

REG. U. S. PAT. OFF.

Handy Man's "Workhorse" PAGE 159

Furniture from the Forest PAGE 173

Beveling and Chamfering PAGE 178

How to Buy Radio Parts PAGE 196

Mining Silver in the Darkroom PAGE 206

An armful of tools and a workbench —take them to the job in one hand with the PS "Workhorse." Page 159

Copyrighted material

Action Station for Small Fry

A combination play desk and dinette Dad can build will keep Junior busy from age one to six.

By Roland Cuera

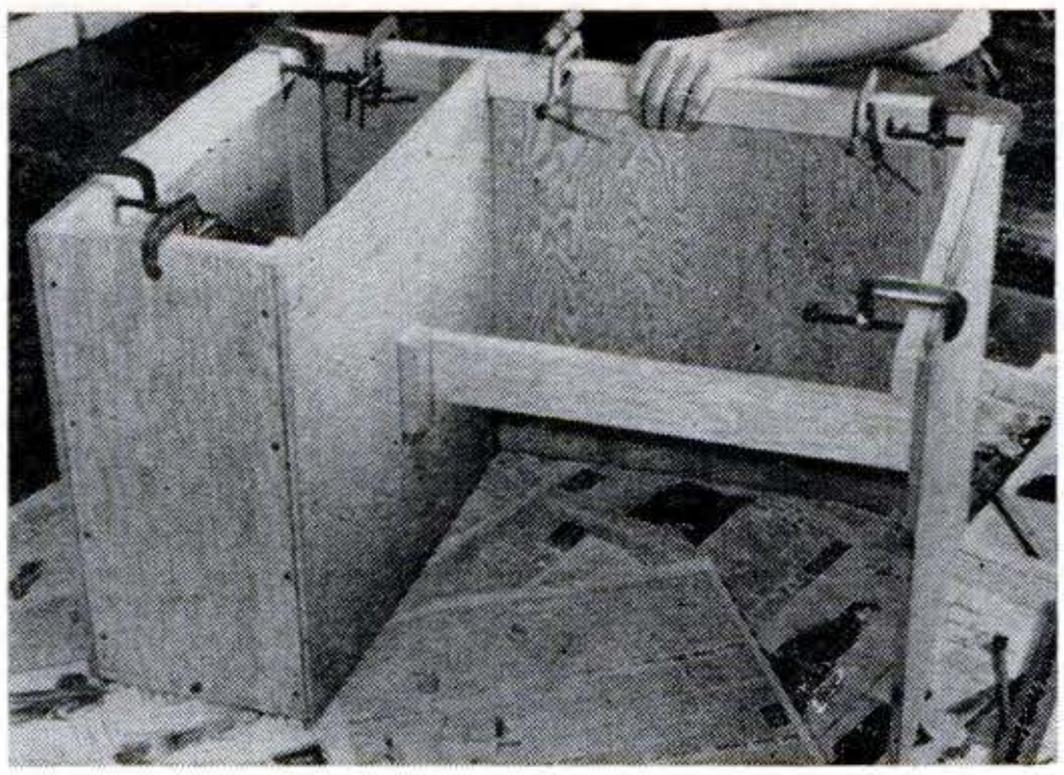
SOME furniture for a youngster's room is bought or built to please the child, and some to please his mother. It isn't often that both generations are satisfied with the same piece. So many of the units that are safe, sturdy, and easy to keep clean seem to rate like spinach with the young ones—healthy but unpopular.

We've had our troubles with Buster's equipment. More than once I invested money, muscle, or both in stuff that just hasn't held his interest for more than a day or two, so I was pretty glad when I hit on this idea. He likes his new game and feeding center, and so do we. The top is so rugged that he can bang away at it to his heart's content, and large enough to accommodate a full-course dinner. Hinged side panels make it a little bit harder for him to sweep his hamburgers onto the floor.

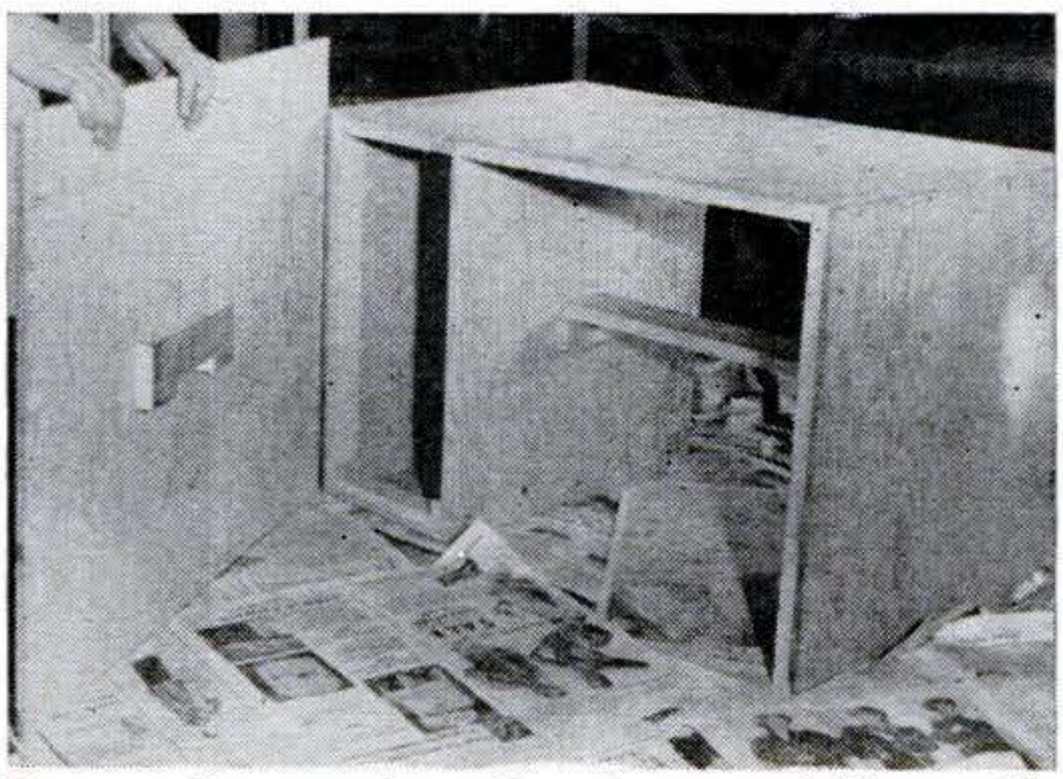
The cantilever chair is adjustable back and forth. It has arms that raise up when you put baby into the seat, then lock down in safety position so that he can't fall out. Below is a foot rest that can be adjusted for both height and tilt. Chair assembly and foot rest are both held in place by bolts and wing nuts that can be removed in a minute. When he gets too old for the seat —which will probably be around three—the whole business can be removed and a conventional child's chair substituted. He can then use the desk section, with its drawer and toy compartment, until he's six or seven —unless it happens to be needed sooner for his kid sister.

Recommended material is ⅜″ plywood for most of the larger pieces (one 4′ by 8′ panel is plenty). Pine or similar wood may be used for all the heavier structural members except the seat board. Springy, well-seasoned hardwood will be needed to withstand the jolts that this piece will have to take.

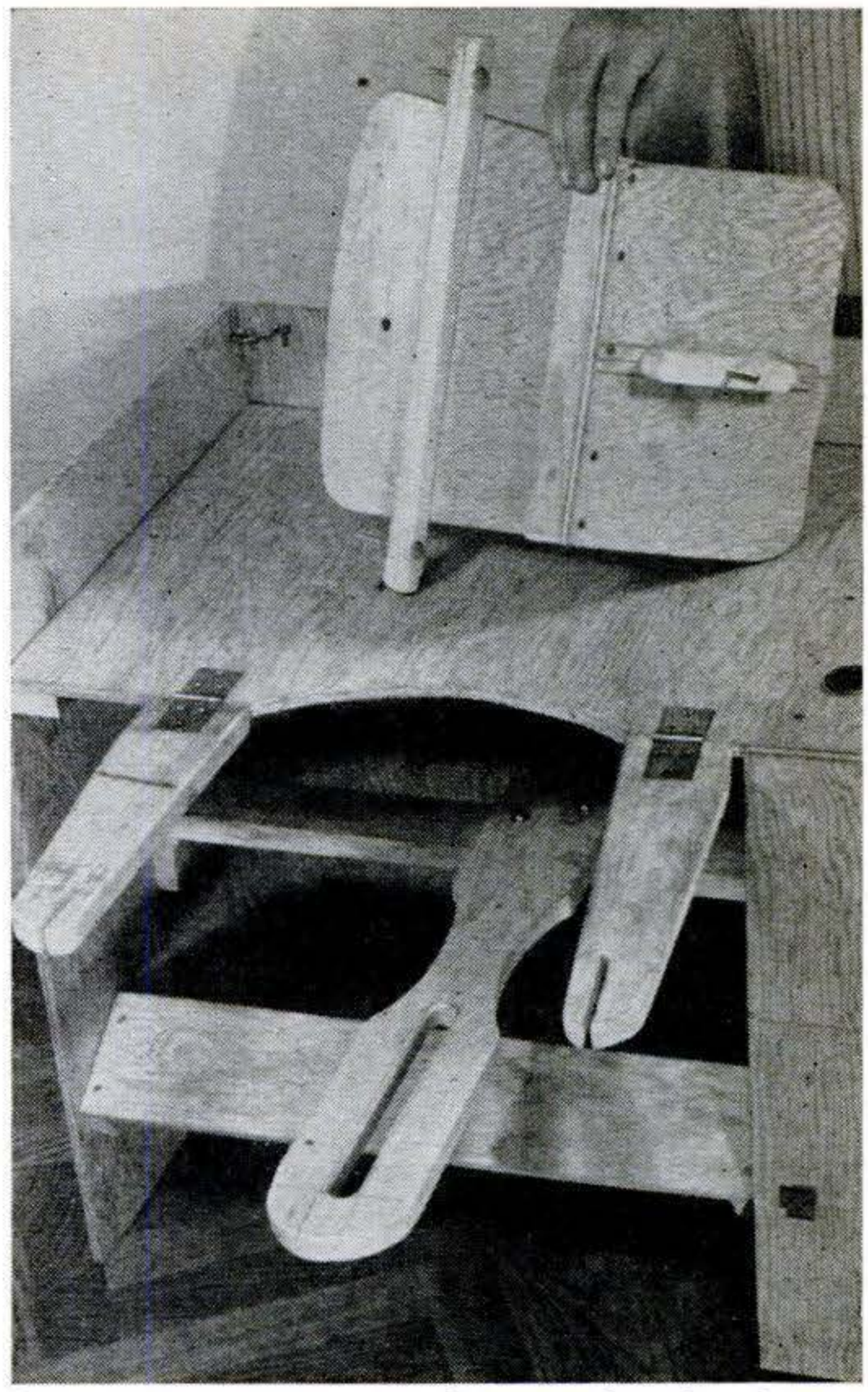
Copyrighted material



Clamps hold the plywood to the frame while it is fastened with screws driven from outside.



Locate the seat-board socket carefully on the back before you fasten this piece in place.



The cleat on the seat bottom fits the slot in the seat board, permitting forward adjustment.

Start by laying out the sides, back, top, partition, hinged side panels, drawer parts, toy-cupboard door, cupboard bottom, seat, and foot rest according to the dimensions given in the drawing. A good way is to cut the individual outlines out of wrapping paper, arrange them on the panel for least waste, tape fast, and draw around them with a straightedge. Cut the pieces out with a sharp 10-point crosscut saw. If you must use a rip or coarse-toothed saw on the plywood, leave a little margin so that you can file off the roughness that results.

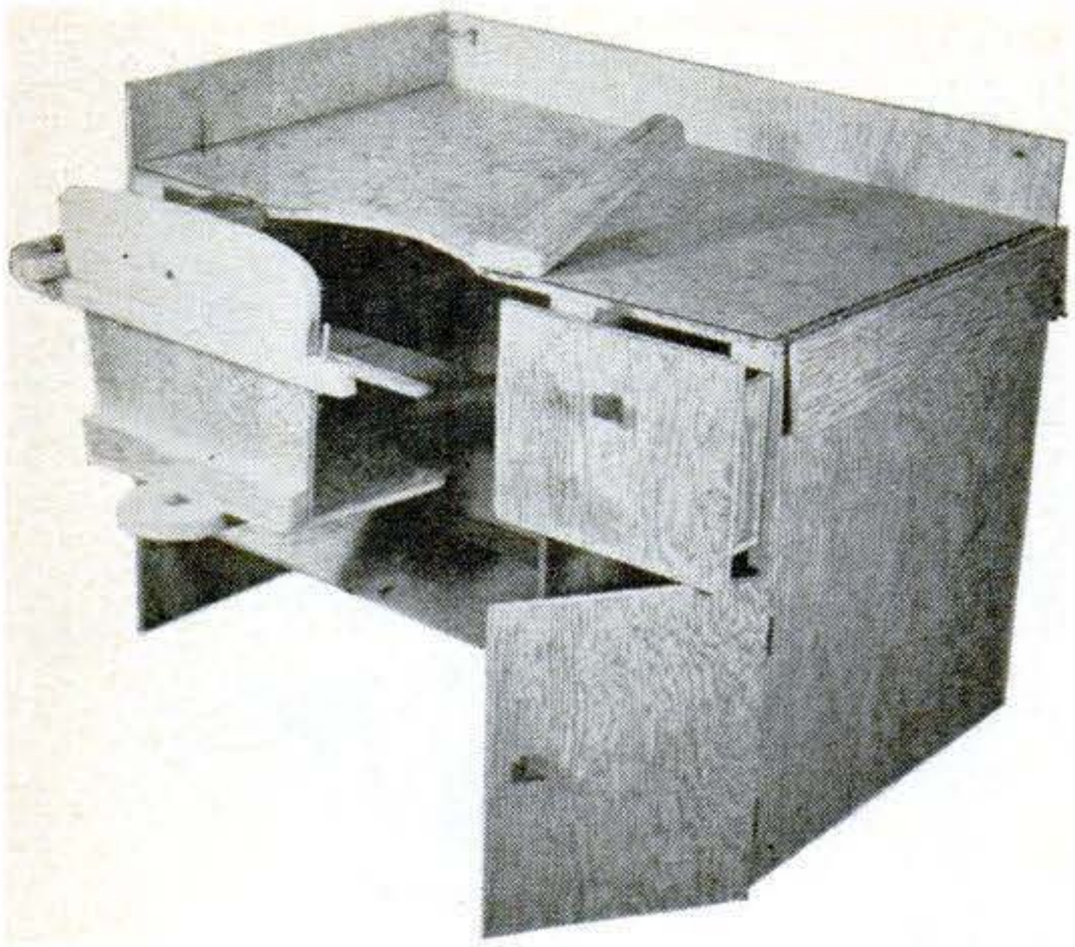
Clamp the framing strips to the sides, partition, and cupboard bottom and screw them in place as shown in the upper left-hand photo above. The screws are driven through the plywood and into the framing. Fasten the top to the sides, and add the partition and bottom. Screw the seat-board socket to the back and put the back in place.

With the desk upright, attach the drawer rails with glue and brads. Hinge the wings and the cupboard door in place. All drawer joints are butted and fastened with brads and casein glue. This construction is strong enough if all the edges are truly squared. Rabbeted, dadoed, or dovetailed joints are harder to make but produce a more professional appearance. If you decide on any of these alternate methods you will have to change the dimensions accordingly.

The top of the chair back is a piece of pine measuring ¾″ by 3¾″ by 11″; it is rabbeted to receive the plywood back. A 1″ by 1″ by 15¾″ rail fastened behind and just below this top piece extends out at both sides to support the ends of the arms. The lower portion of the back is reinforced by a ¾″ by 1¾″ by 9½″ cleat to which the seat bottom is screwed. Plane a slight bevel on this piece before attaching the seat bottom so that the back will slant a couple of degrees off the upright position (a comfortable seat is an important item in the rearing of your child).

Another cleat ¾″ by ¾″ by 4″ is screwed to the bottom of the seat. Drill a hole through it and the seat for a countersunk flathead bolt. The cleat rests in the slot in the seat

Copyrighted material



Completely assembled, the play desk is ready for sandpaper, paint, decoration, and the baby.

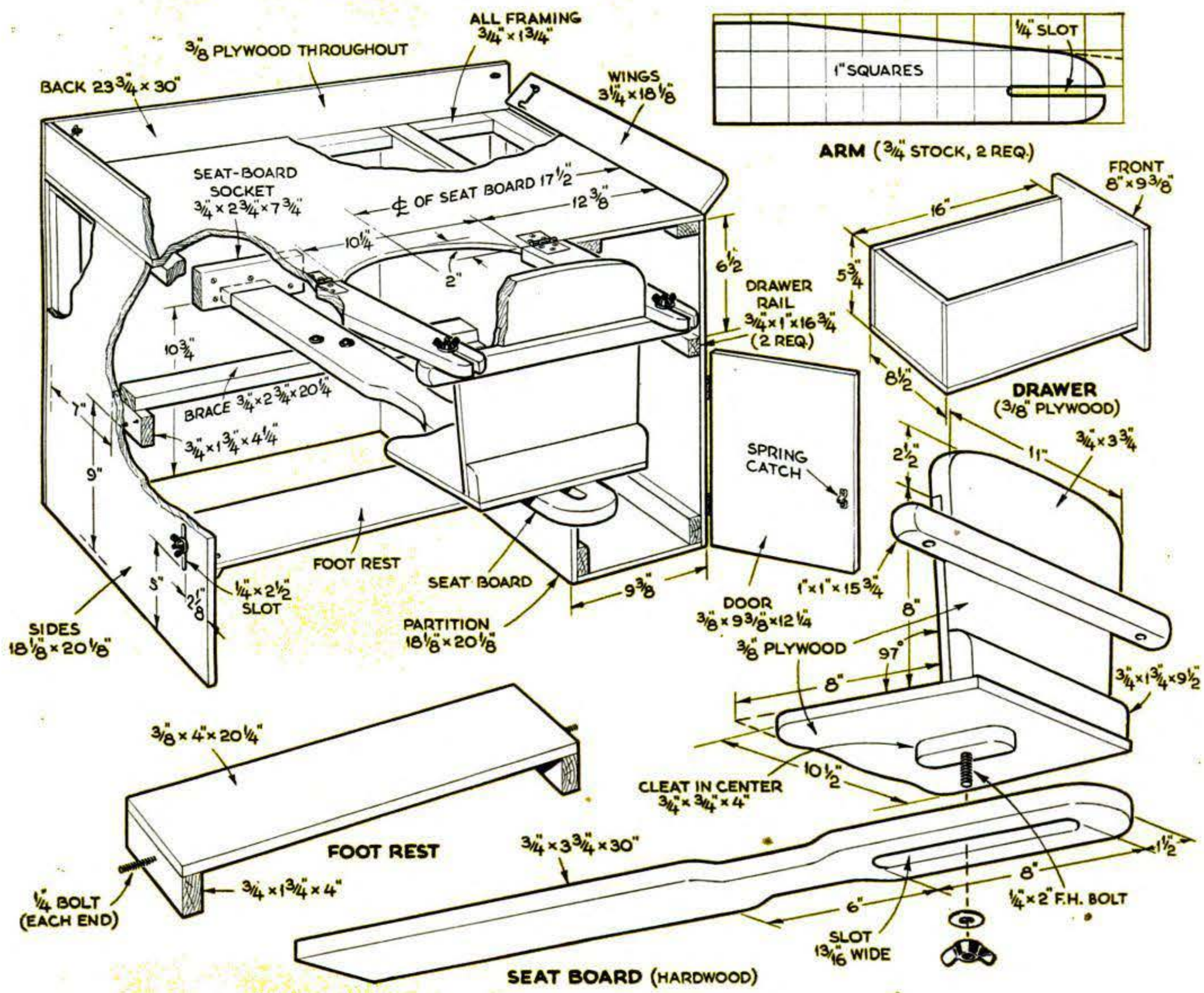
board and is adjustable simply by loosening the wing nut on the bolt.

The seat board itself is made of ¾″ by 3¾″ oak, hickory, or other springy hardwood. Cut the arms from ¾″ stock and hinge them to the desk top. Slots in the ends allow play across the hold-down bolts for seat adjustment and also for bounce when the child is in the seat.

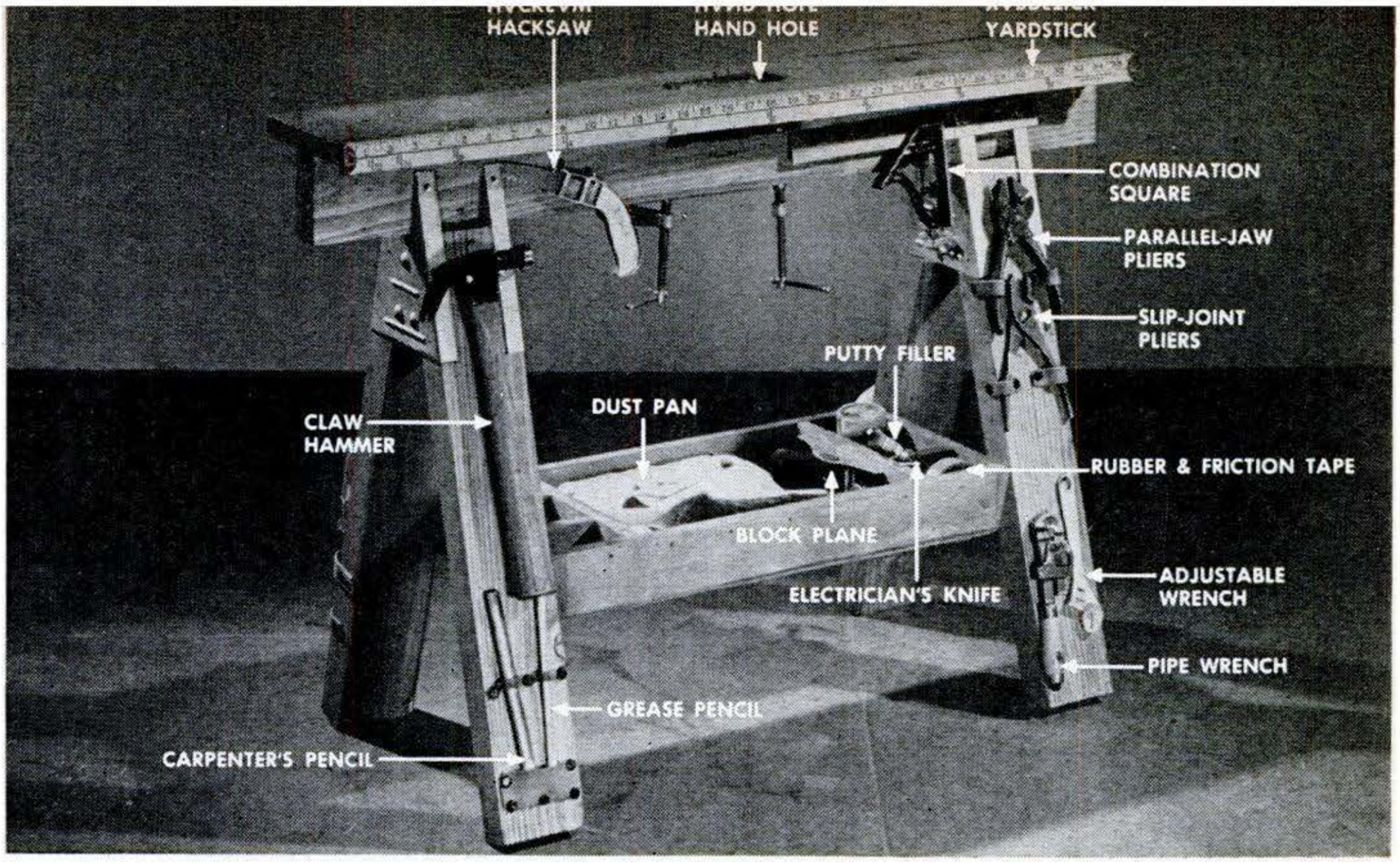
Install the seat board with two stove bolts through the brace. No fastening is necessary at the end since this fits into the socket.

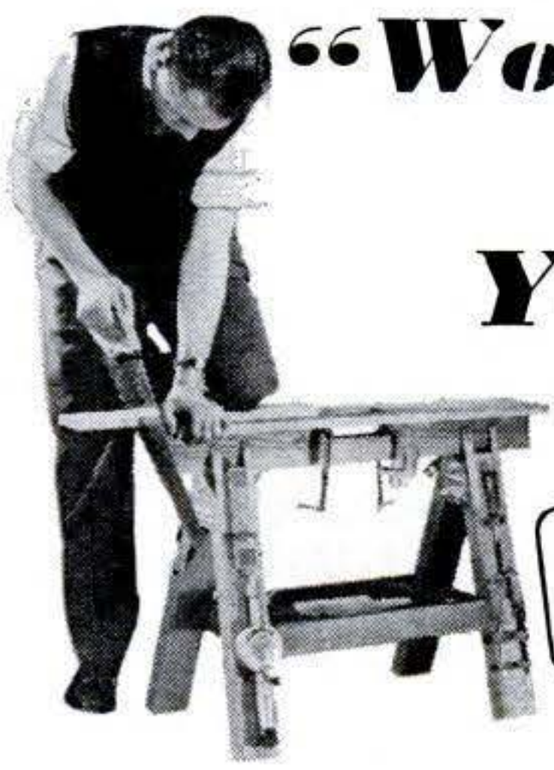
Stove bolts are driven through the centers of the two cleats to which the foot rest is fastened. The bolts project through slots in the left side and partition. Wing nuts and washers—one outside the left end, the other inside the cupboard—hold the foot rest at the desired height and angle.

Sand all parts—especially the plywood edges—and apply a coat of flat white paint. Follow this with one or two coats of enamel of any desired color. Attractive decals, nursery-book cutouts, or hand decoration can be used to finish the design. A piece of linoleum on the top will make it a cinch to keep this hard-working desk as clean as nursery furniture should be. END



Copyrighted material

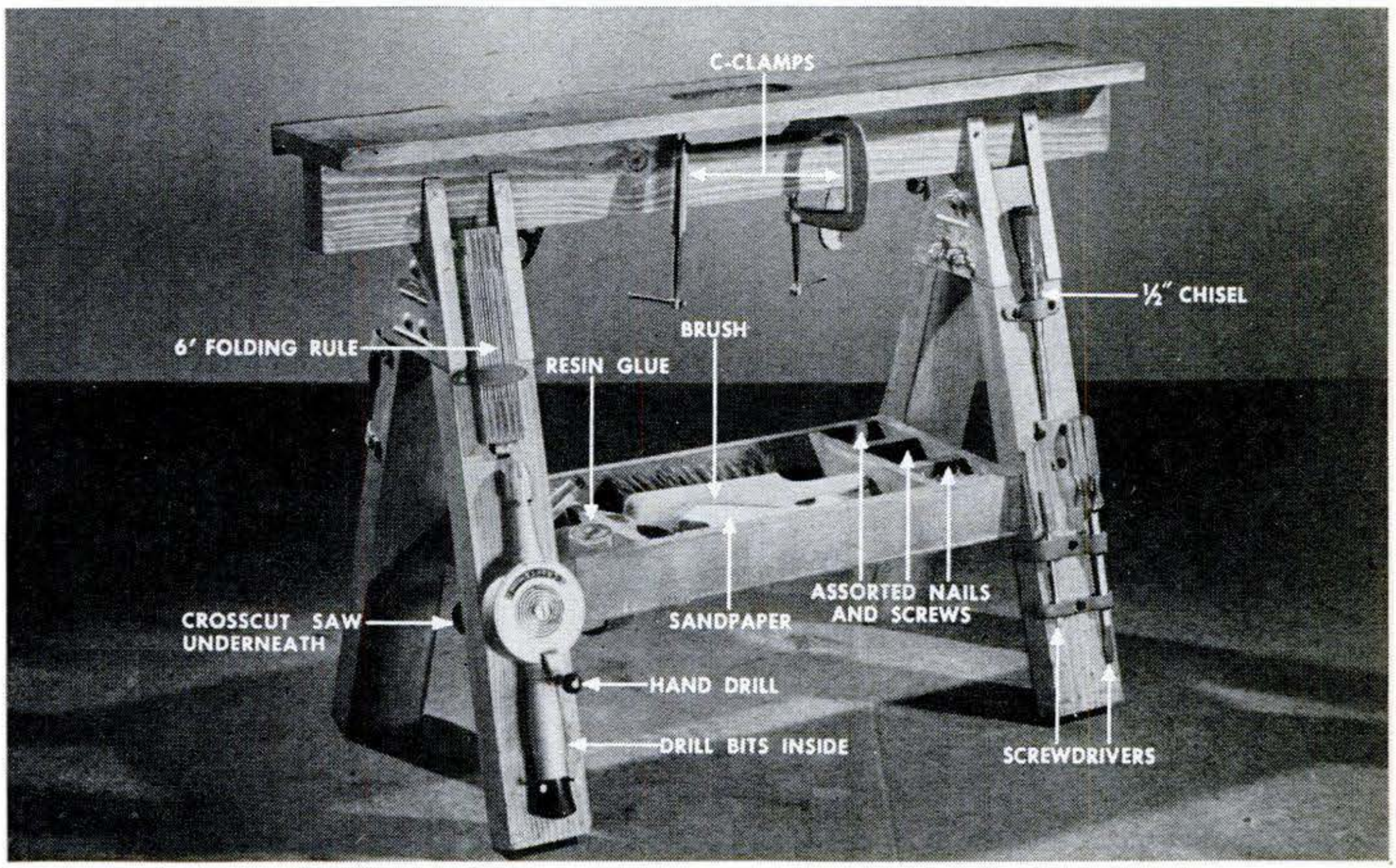




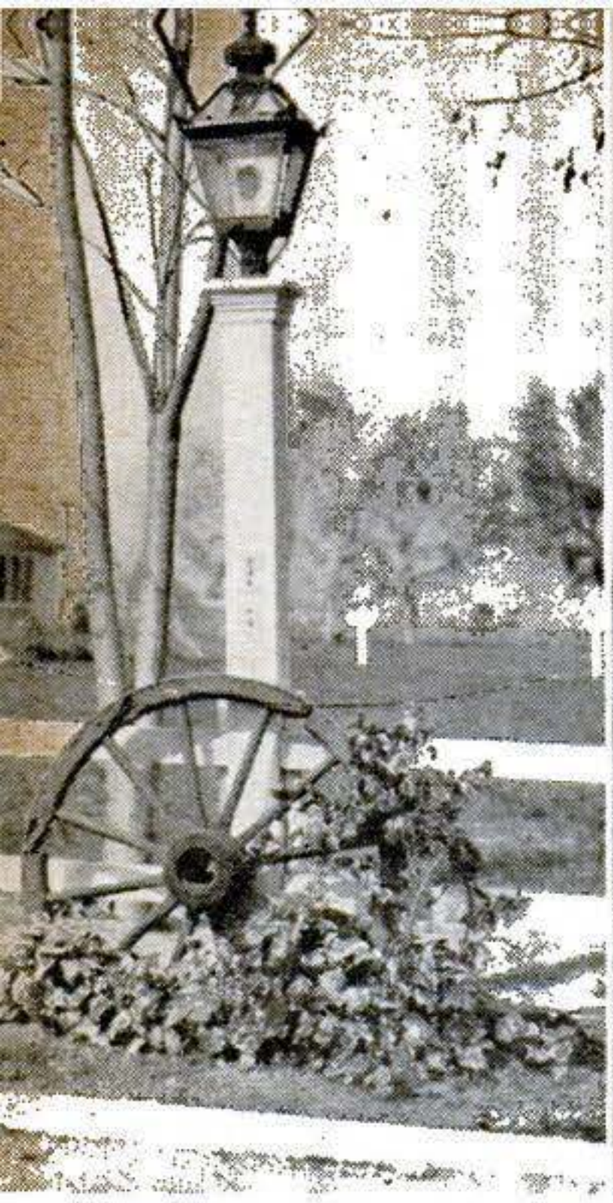
"Workhorse" Carries Your Tools

Popular Science Practical Solution

A NATURAL for the handy man of the house, the PS "Workhorse" takes the bench to the job. The Editor designed it for his own use to save those extra trips to get forgotten tools. It provides a working surface for routine fix-it chores—and it even has a brush and dustpan for cleaning up afterwards. Start out by making yourself a sturdy sawhorse, add a plank top and a compartmented shelf, and fit it with the tools that you use most often for odd jobs. Strips from an old belt make fine tool-holding loops.



Copyrighted material



Take your pick of three designs. At left is one with a glass top. Plans for center one, which has frosted glass panels, appear below. Wrought-iron scrolls support the one at right.

Post Lamps to Mark Your Drive

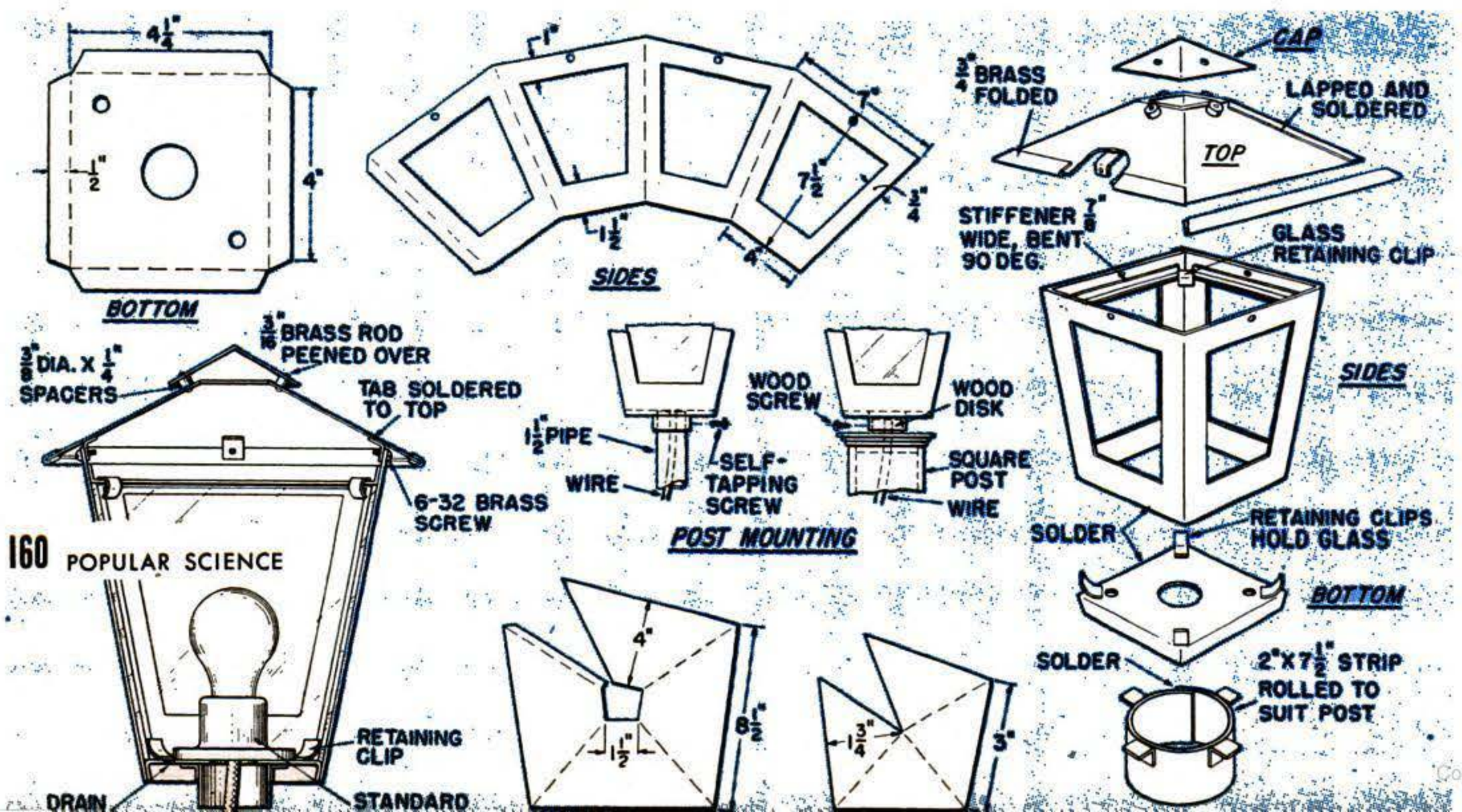
ENTRANCES and driveways gain an air of pleasant dignity with these post lamps, borrowed from the past but modernized with electricity. They aren't hard to make of 1/32″ sheet copper, calling only for a little care in laying out and soldering.

The construction below can be adapted to various lamps. Make the bottom first, drilling drain holes outside the mounting collar and cutting the center for a porcelain socket. Solder retaining clips at each corner.

The sides are cut as one piece. Lay out a cardboard template in the form of a truncated triangle 7″ on the base line, 7½″ high, and 4″ wide at the top. Draw the glass opening inside. Scribe around it on the copper; then lay it along the scribed outline and trace again, continuing until you have a four-sided pattern. Cut the windows with a chisel while resting the metal on a wood surface.

A top and cap also are each cut as a single piece. Lay out both with templates (the cap template is a 3″ triangle). Solder tabs under each edge of the top and drill and tap for 6-32 brass screws ¼″ long. This makes the top removable. Strips of brass bent into a U-shape, slipped over each edge, and soldered give a more finished appearance. The cap is riveted on, with spacers between.

For mounting on a pipe post, roll a collar to suit, solder to the bottom of the lamp, slip the collar over the post, and turn in a self-tapping screw.—*Hi Sibley, Nuevo, Calif.*



Copyrighted material

What's Your Ingenuity Quotient?

Happy though married, it nevertheless riled me to have to hold skeins of wool for my wife just when I wanted to read my paper. One night, seeking a way to escape the chore, I loosened the finial on a lamp and laid the skein around the shade. My spouse wound the yarn while the shade spun merrily.—*A. B. Iannone, Lyons, N. J.*

You can't pull the wool over baby's head when a washed bonnet dries all out of shape and shrunken to the size of a head-hunter's trophy. Baby himself supplied me with the answer to that one. Now I blow up rubber balloons to the size of his head. Woolen caps and bonnets are pulled over the balloons while still wet. They dry to size.—*Mrs. Bob Smith, Venice, Calif.*

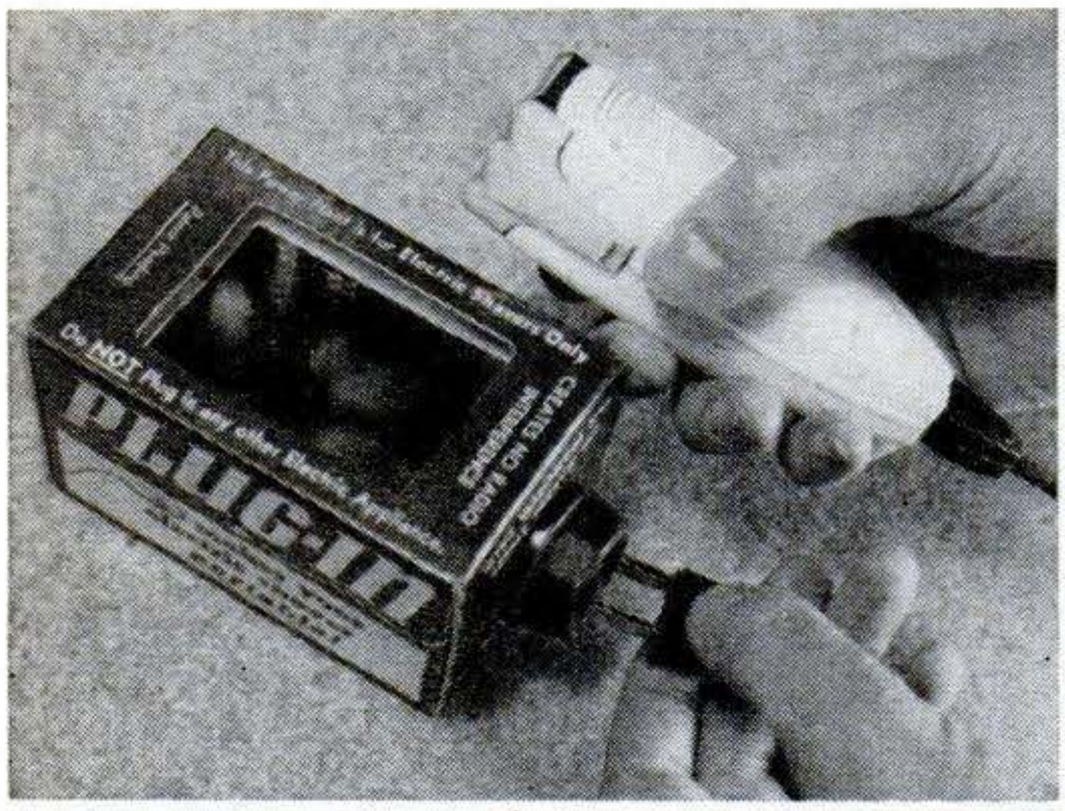
I was in a jam when film jammed in my camera just as I was discovering the Grand Canyon. To open it meant I'd lose pictures taken, yet I didn't want to stop shooting. Zipping up a leather jacket, I laid it face down with the camera inside. Neck and waist were folded and weighted down. With my arms in the sleeves, the job was done.—*A. P. Jeanneret, Roselle, N. J.*

My son, an owl, was always coming in very late at night, and then swearing on a stack of pancakes the next morning that he hadn't. So I fastened a black thread to the wall, led it across the stairway, and tied the free end to a switch supplying current to an electric clock. No matter how silently he pussyfooted in, the stopped clock would show the time of his return.—*H. C. Boyd, Dearborn, Mich.*

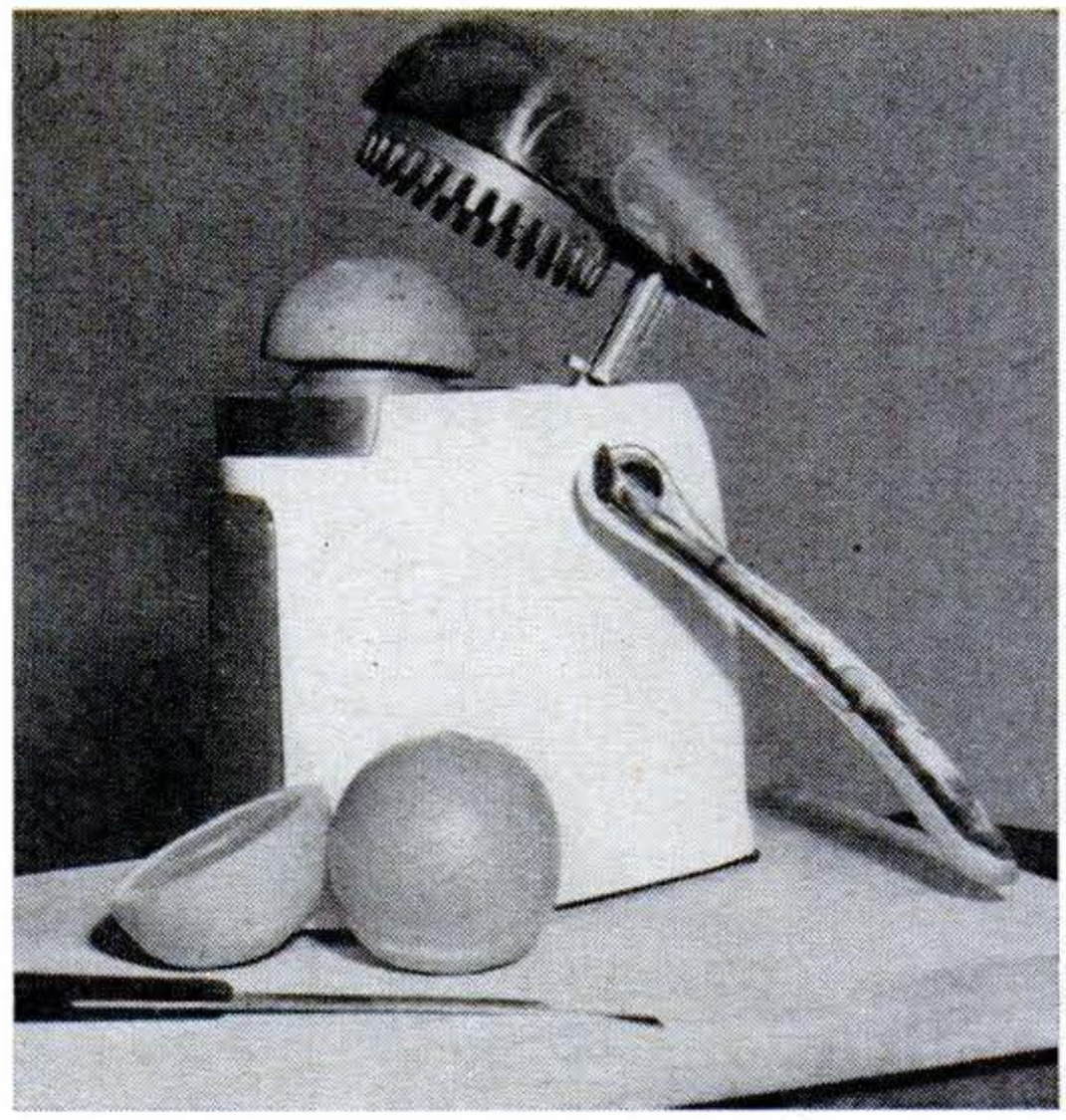
Have you pulled off a smart one lately? We will pay for acceptable contributions showing ingenious solutions of problems in the home, shop, garage, or camp. It doesn't matter if it's wacky—if it works. Use government postcards only. Contributions cannot be acknowledged or returned.

Copyrighted material

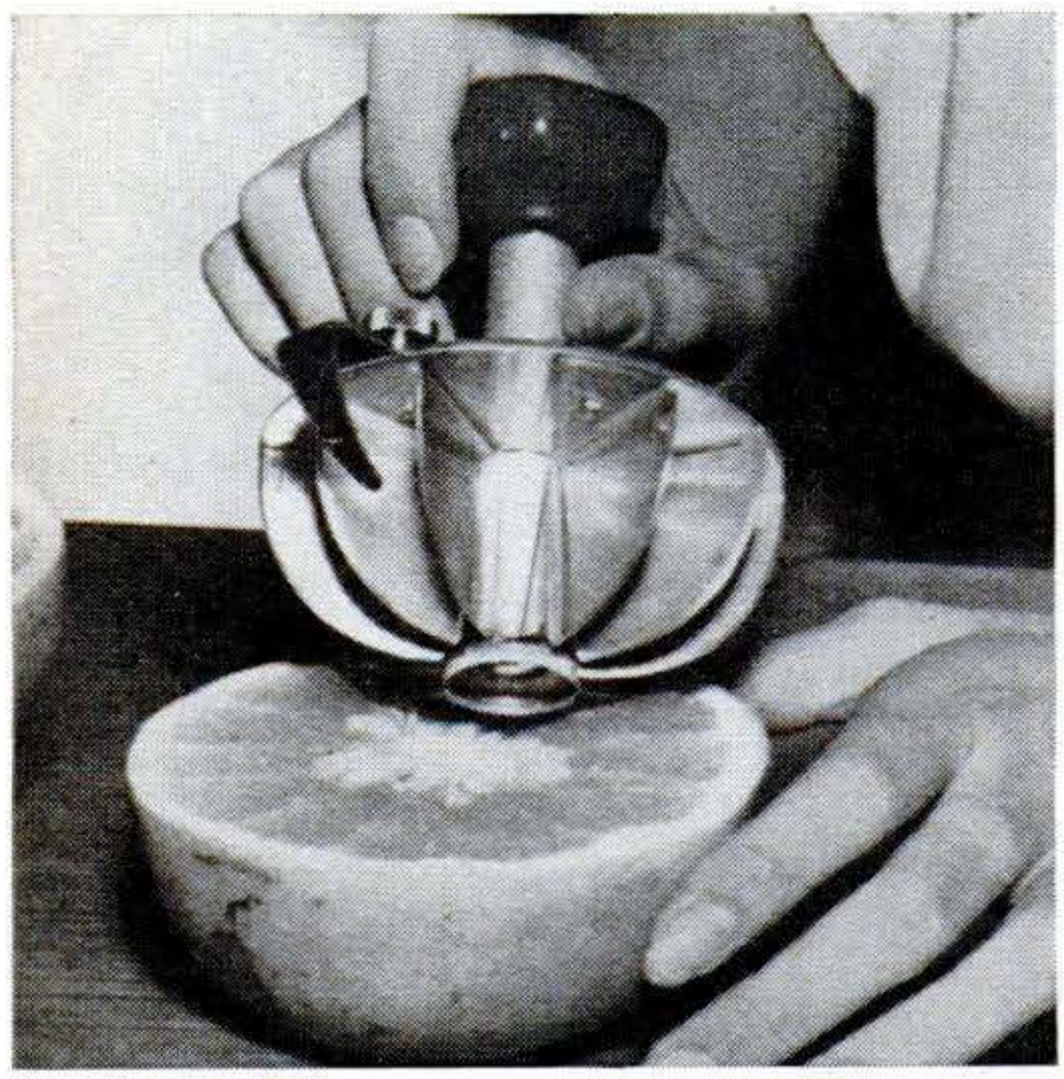
AIDS TO MODERN LIVING



Battery Operates Shaver. A small battery with an output of 115 volts makes it possible to use an electric shaver at camps or on trips where electric power is not available. Measuring 2½" by 2¾" by 4¼", the unit has a built-in mirror on one side. The manufacturer claims that it's good for about 100 average shaves. A product of the Bernard S. Greiff Co., San Francisco, the unit sells for about $3.



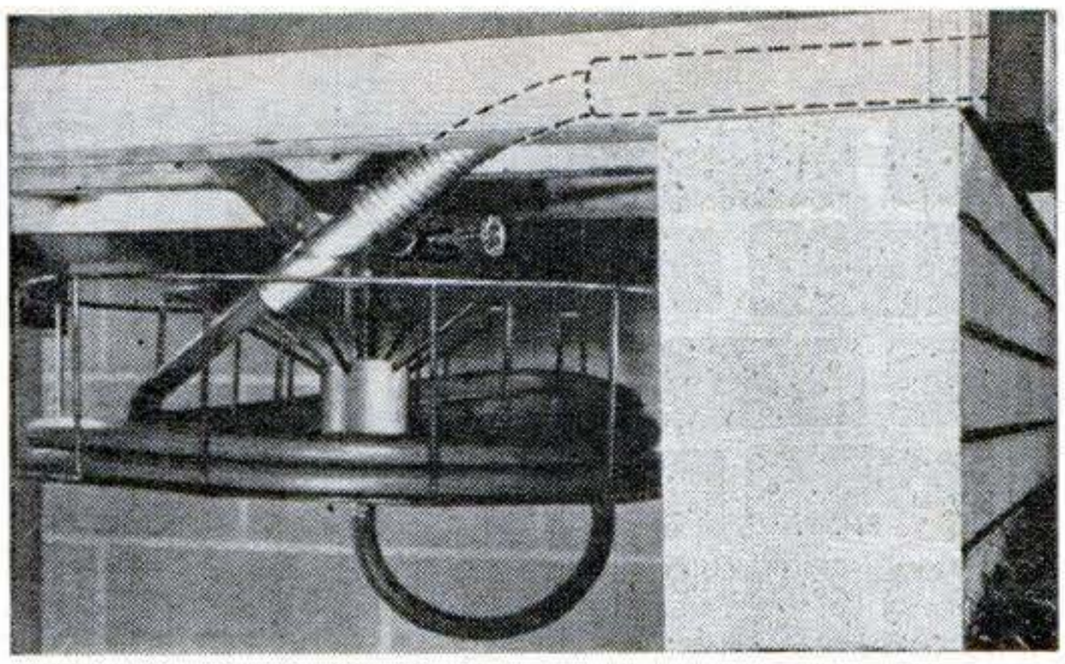
Juicer Top Tilts Out of Way. When you're using a new fruit juicer introduced by the Rival Manufacturing Co., of Kansas City, Mo., a backward turn of the lever both raises the top and tilts it back to allow easier removal and insertion of the fruit. The rack-and-pinion mechanism is geared low to put heavy pressure on the fruit with less effort. A built-in pitcher catches the juice as it's pressed out.



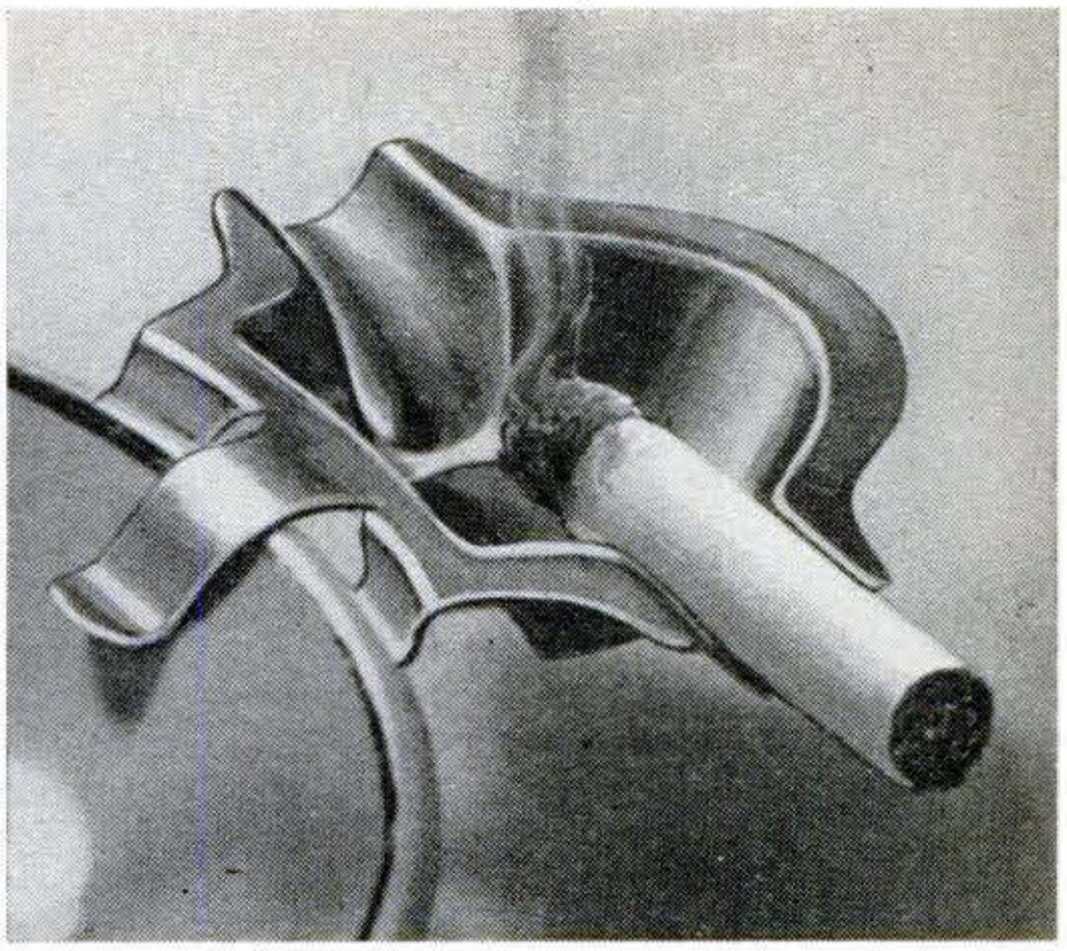
Grapefruit Easily Cut. A new kitchen tool made by the Special Products Co., of Silver Spring, Md., prepares grapefruit halves in a few seconds. It consists of a hollow metal center post encircled by 12 metal blades and an adjustable knife that cuts the fruit away from the rind when the tool is turned. The center cuts out the core.

Toy Dog Has Electric Eyes. The eyes of this toy dog are small electric bulbs that light up when the stuffed body is pressed. The colored bulbs and a battery inside the toy are replaceable when they wear out. Distributed by the Bernard Fine Company, of New York City, the toy sells for approximately $3.

Copyrighted material

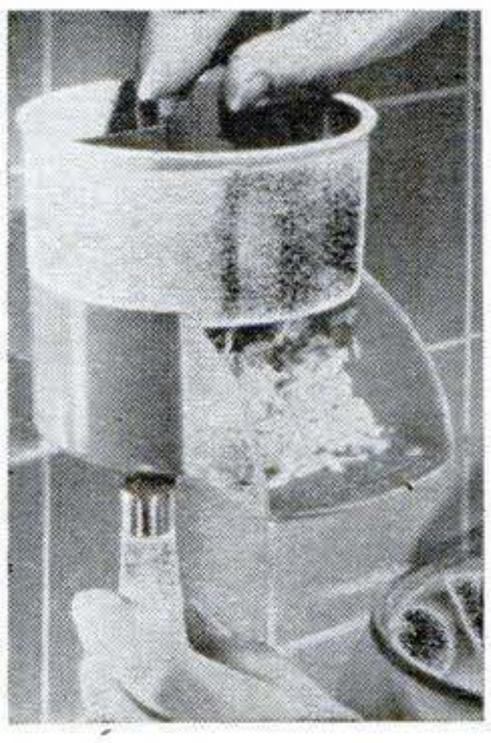


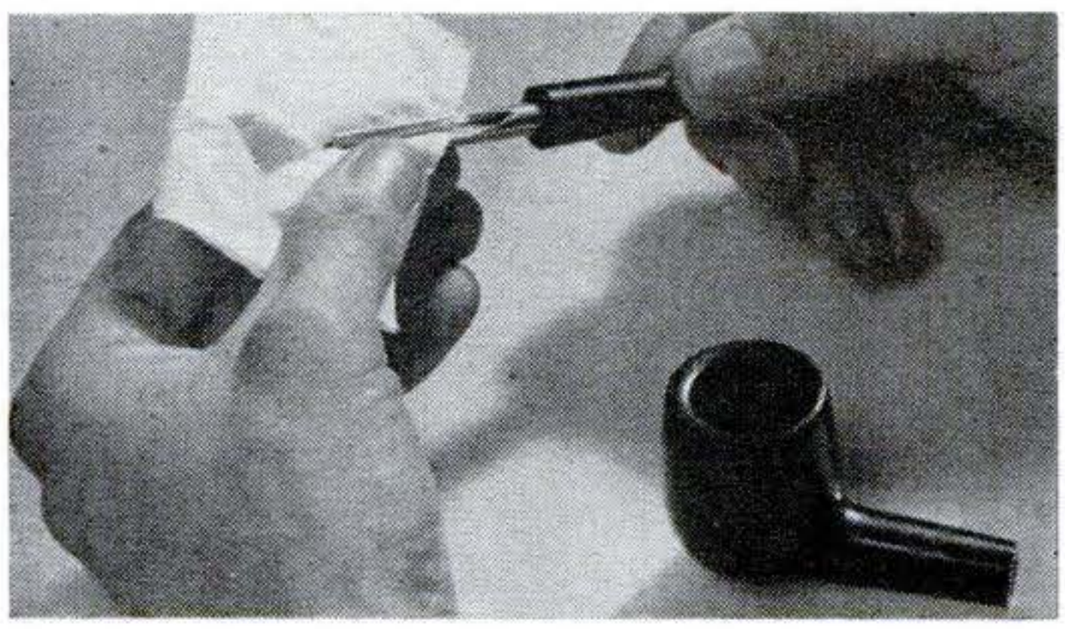
Hose Stored on Cellar Reel. Installed on the cellar ceiling, this garden-hose reel makes the hose easily available, yet stores it out of the sun. Permanently attached to the water line, the hose extends through a casing to an outlet box mounted outside the house. In addition to the nozzle, the box contains an extension rod that operates a shut-off valve in the water line. The hose is returned to the reel by pushing it back through the casing. Zierden Manufacturing Co., of Milwaukee, Wis., makes it.



Tray Clips to Saucer. These little silver-plated ash trays are designed to keep cigarette ashes out of coffee cups or saucers. Clipped to the saucer, they give each smoker an individual ash tray. Alfred H. Glasser, of New York City, offers them in sets of four for $3.50. They're intended for parties.

New Grinder. A plastic kitchen unit made by Trade Winds Specialties, Miami, Fla., combines features of a shredder, slicer, and grater. Interchangeable stainless disks do the cutting when the bottom handle is turned. It's installed on the wall.



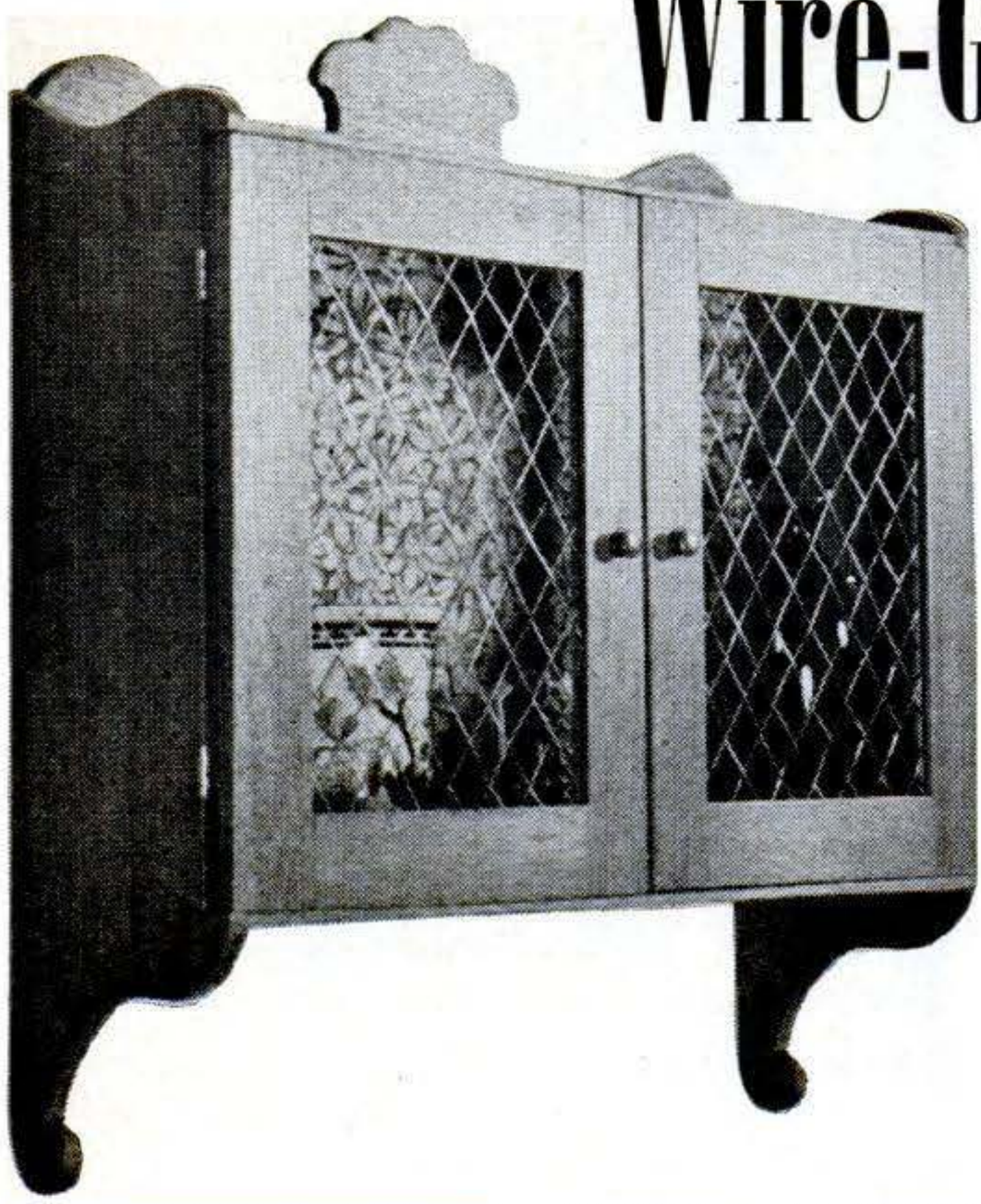


Pipe Has Cleaning Fork. Split metal tubing on the inner end of the stem makes it easier to clean this pipe. A piece of tissue may be inserted in the fork as seen here and then twisted into small size to ream out the shank or mop the bottom of the bowl. A product of Bunnell Pipes, of Stratford, Conn., the pipe sells for about $5.

Cleaner Weighs Only 6½ Lb. A portable tank-type vacuum cleaner just introduced by General Electric may be easily carried slung from the shoulder or held by the strap. Measuring 6″ by 6″ by 14″, it has about 75 percent of the suction of a typical full-size cleaner. It comes with five slip-on attachments, plus a flexible hose.

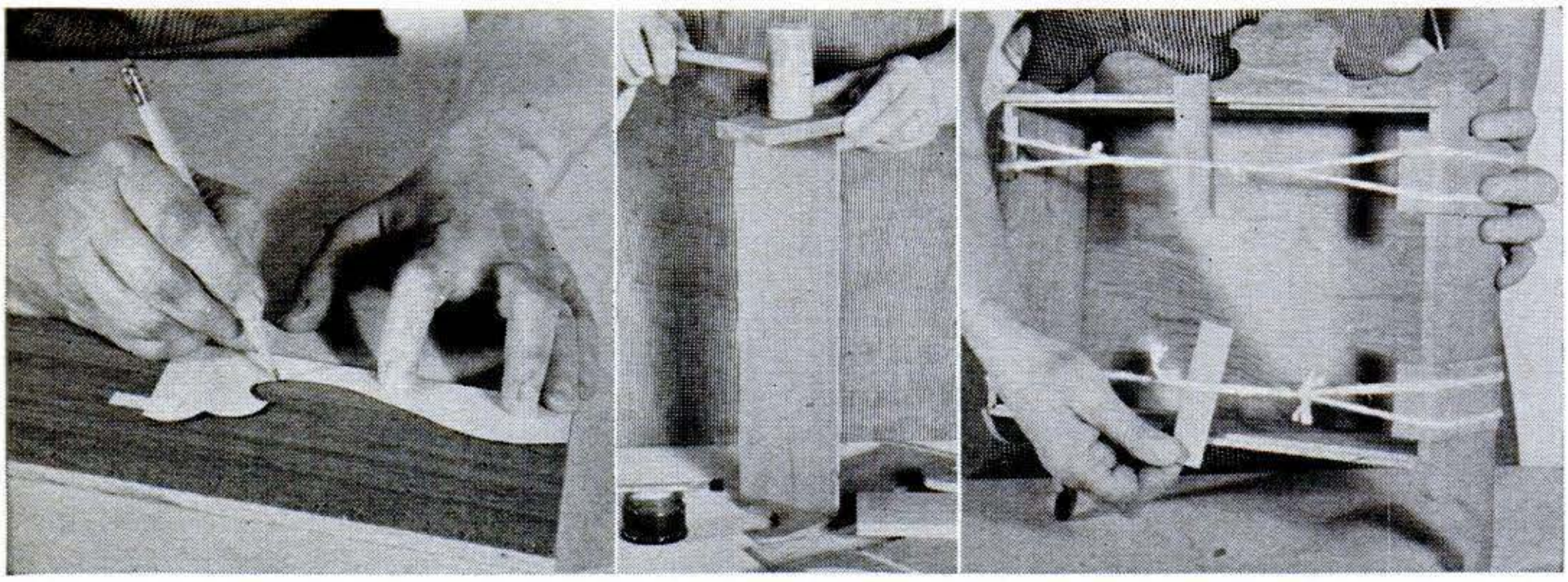
Copyrighted material

Wire-Grille Doors Frame Small Cabinet

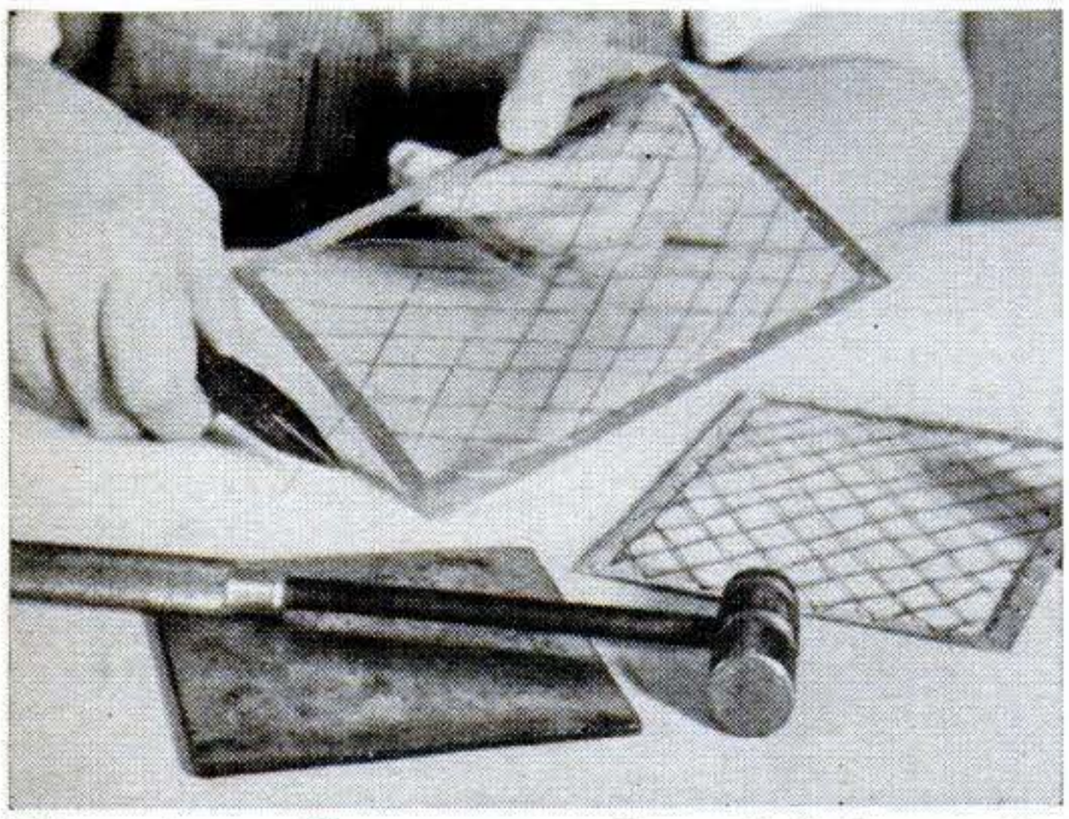


ODD pieces of bric-a-brac, especially the curios that many people enjoy collecting, deserve to be set off in a cabinet of their own. This showpiece will draw attention to them, yet give them the protection that only doors can afford.

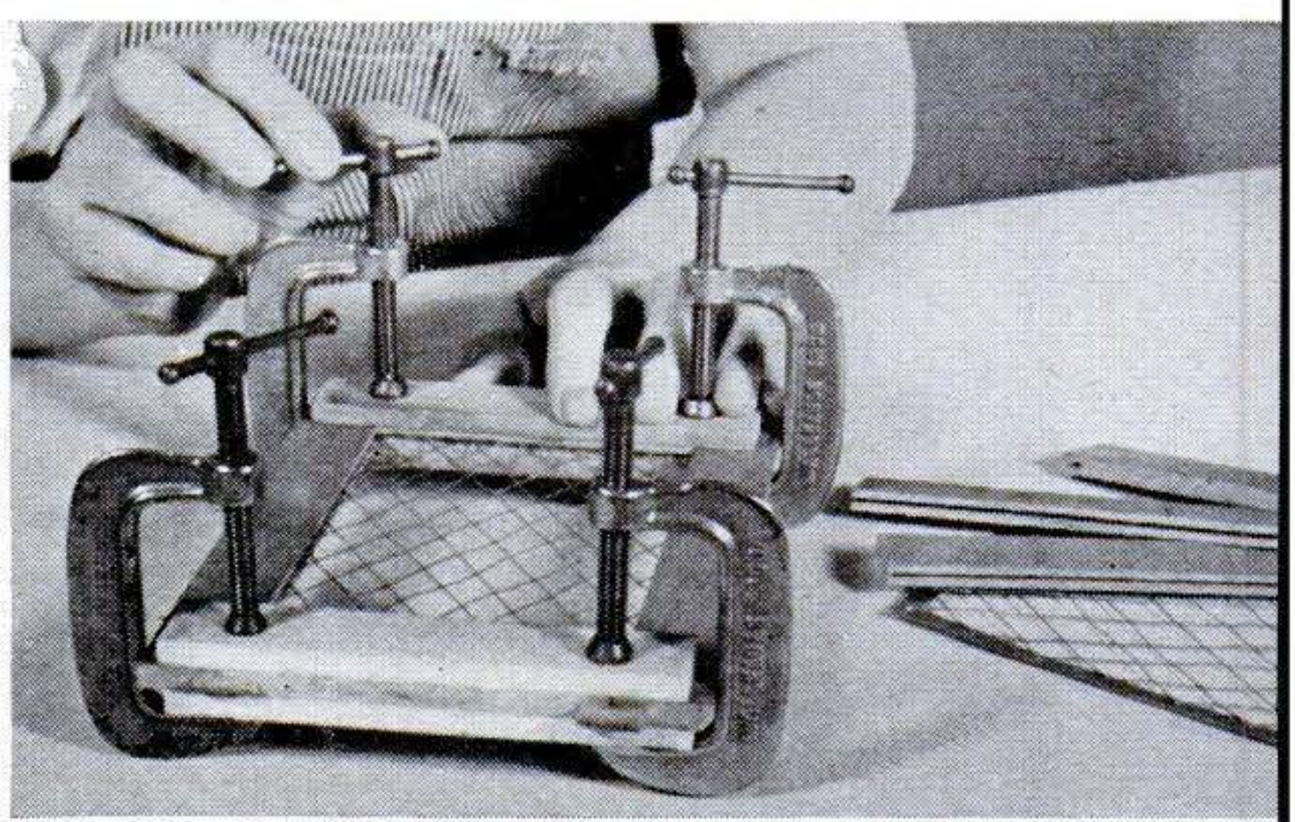
To make the laced-wire grilles used in the doors, cut two frames from any thin sheet metal. In this case 20-gauge iron was used, and the same gauge of brass wire for the grid. Each of the rectangular frames can be cut in a single piece or made up of two L-strips or four individual members soldered



Half-pattern template (left) is taped to top at centerline and flipped over for second half. Center photo shows the bottom shelf being driven into a glued side dado with block and mallet. Tourniquets, right, are used to maintain pressure while the glue sets. Small pieces of cardboard protect the work, while the rectangular back piece holds it square.



The wire grille is woven through holes in the metal frame. Wire ends are laced in and out of adjacent holes, bent over, and hammered down.



Grooves or saw kerfs in the wooden-frame members hold the grille. Projecting parts of the splines are trimmed after the glue has set.

Copyrighted material

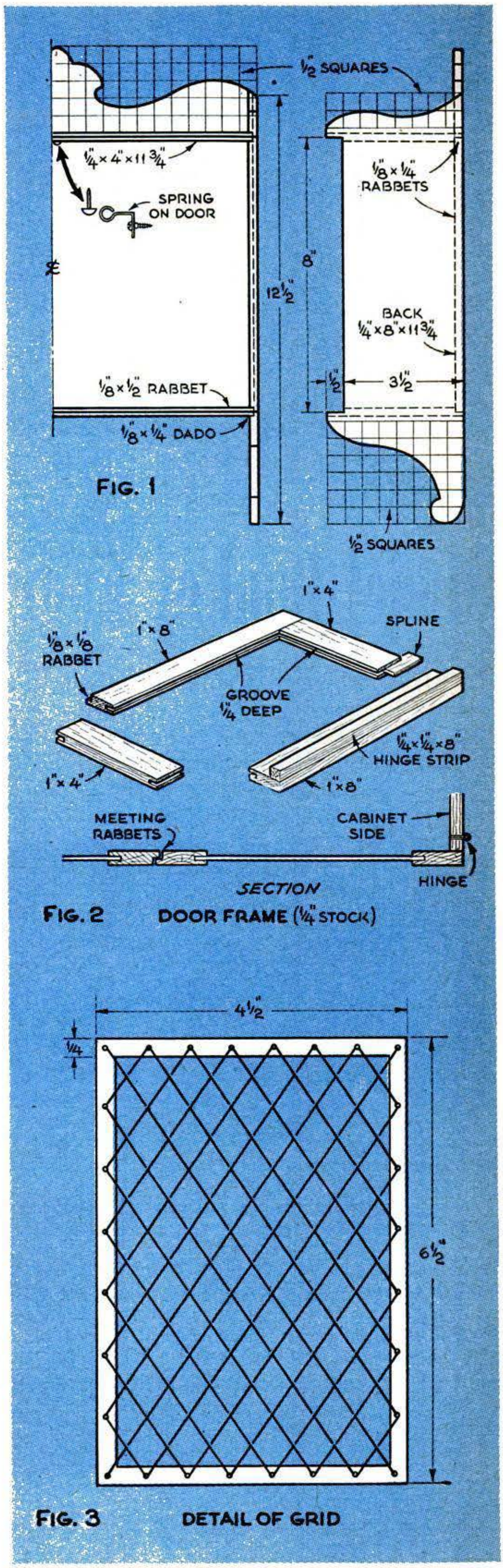
at the corners. The ends of the wire may be soldered to the frame at the points indicated in Fig. 3, or holes can be drilled and the wire woven through with the ends soldered or hammered down. In either case make sure that the lacing is tight.

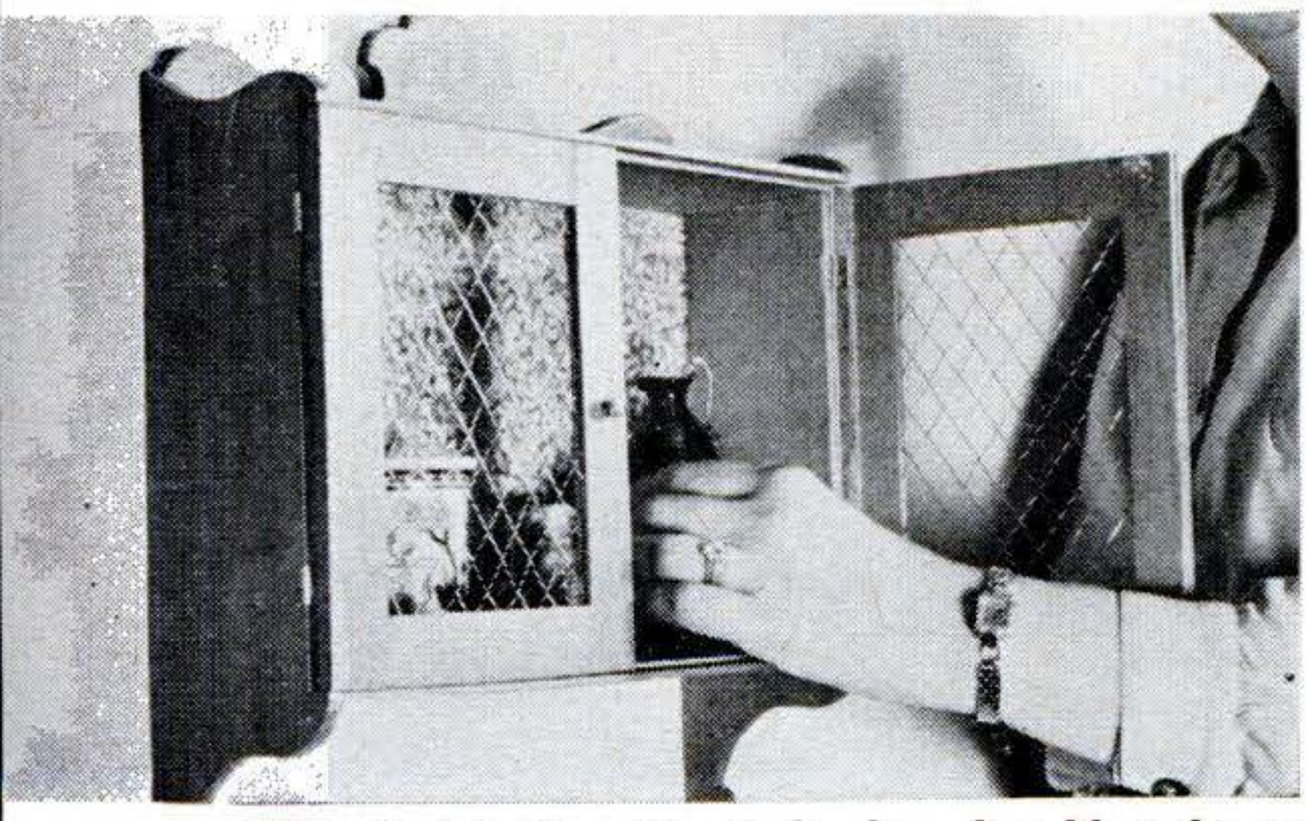
Each grille is set in a frame made of four pieces of ¼″ wood (Fig. 2). Groove the frame members to provide a snug fit for the grille. A strip of wood is glued to each door to provide thickness for the hinge screws. Hinges are recessed into gains.

On the pieces to be used for the sides, top, and bottom of the cabinet, make the rabbets and dadoes indicated in Fig. 1. Lay out cardboard templates of the fretted portions to transfer the design for jigsawing. Both sides can be cut in one operation. In assembling the members of the cabinet, use a small glue brush and carefully confine the glue to the dadoes and rabbets.

While hinges and knobs for the doors can be readily purchased, it may be difficult to find a catch that is small enough. You can make your own with an upholsterer's nail and a scrap of spring metal arranged as shown in the inset of Fig. 1. The spring should engage the nail head when the door is closed.

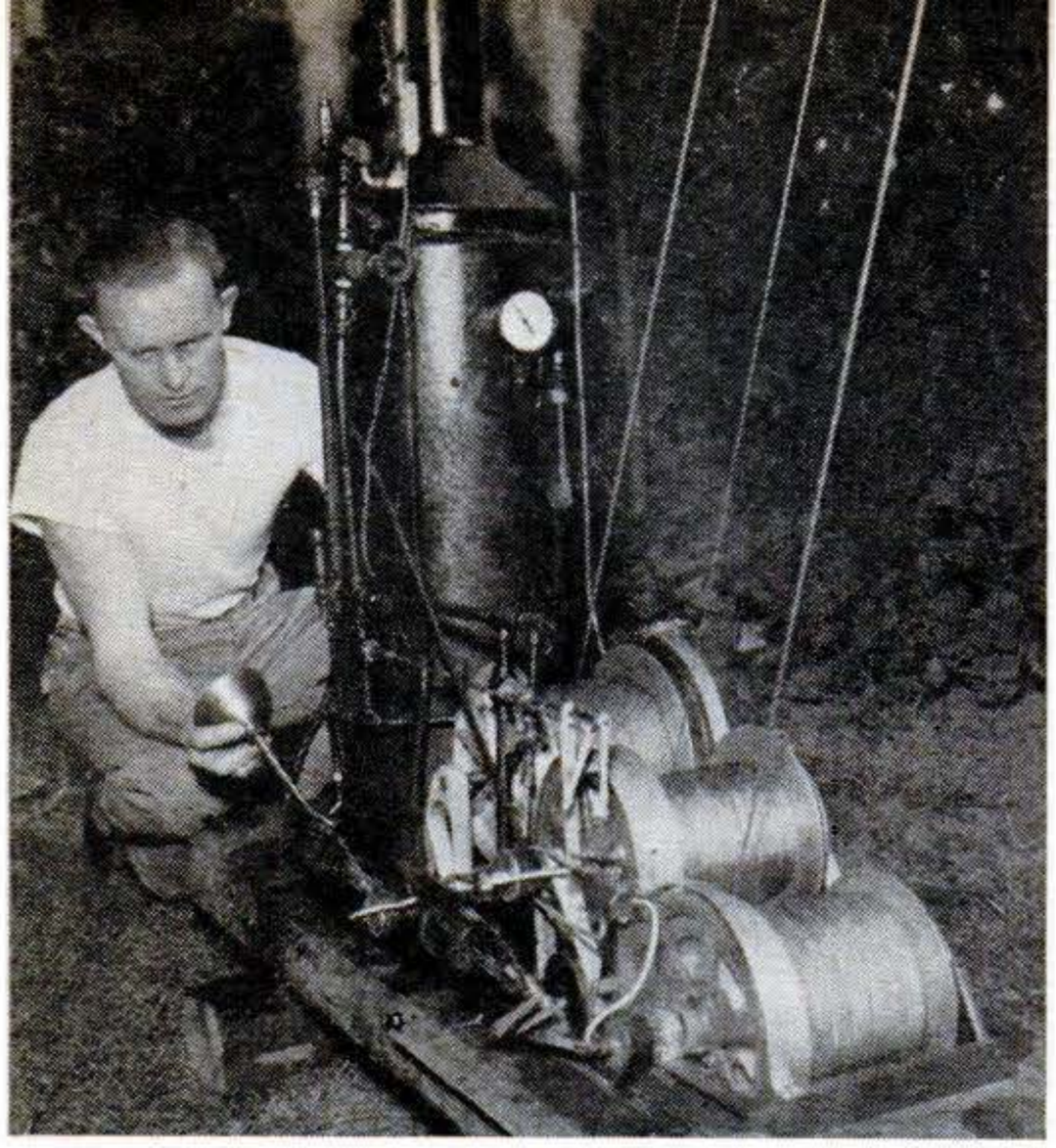
The finish to be applied will depend largely on the kind of wood you use. Mahogany was employed for all parts of this unit except the back. This is cheap plywood covered with small-figured, colorful wallpaper. The mahogany was sanded with fine paper and given two coats of diluted shellac. When dry, each coat was lightly steel-wooled. For the final finish, polishing wax was rubbed with a woolen cloth.—*Bertram Brownold, Cedarhurst, N. Y.*





The finished cabinet displays knickknacks to good advantage. A piece of colorful wallpaper is glued over the inside of the wooden back.

Copyrighted material



Three drums take the lines, made of airplane control cables. The sky line is in the rear; middle is haul-back line; front is main line.

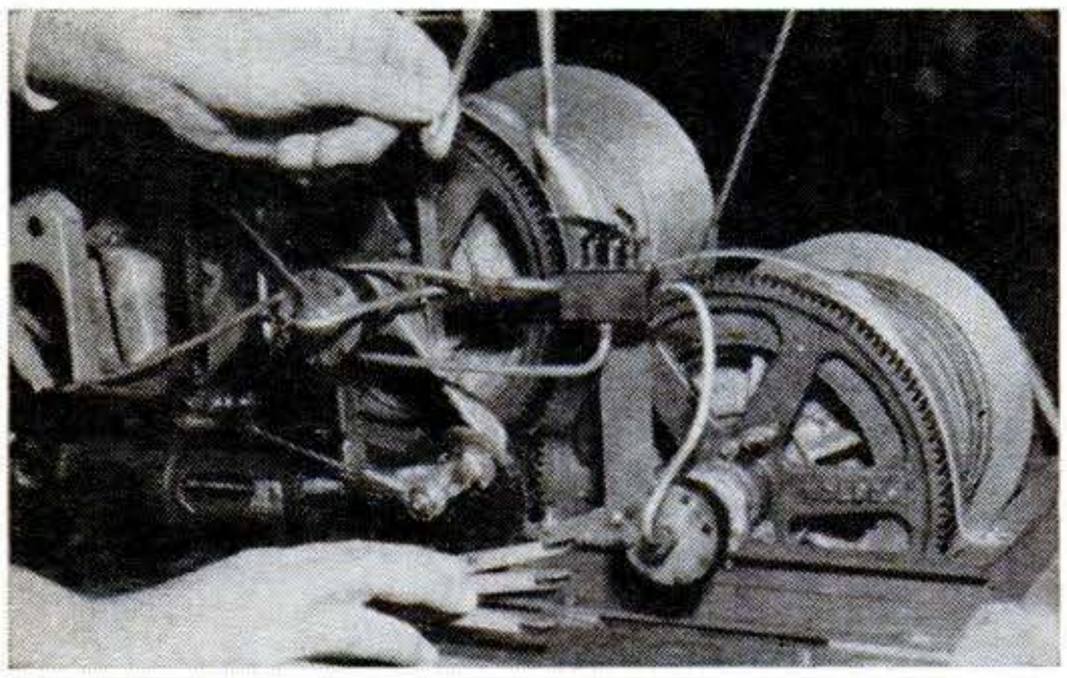
Two small logs swing down from the high line as Smith lightly fingers the throttle levers and brake pedals. Note the intricate rigging.

Model Donkey Engine Handles Real Logs

THIS back-yard steam-driven donkey, a rig known to loggers of northwest forests as a slack line, handles timbers just like its big brothers. It hauls small logs across the yard and deposits them at the foot of a spar tree, ready to be hauled away in trucks.

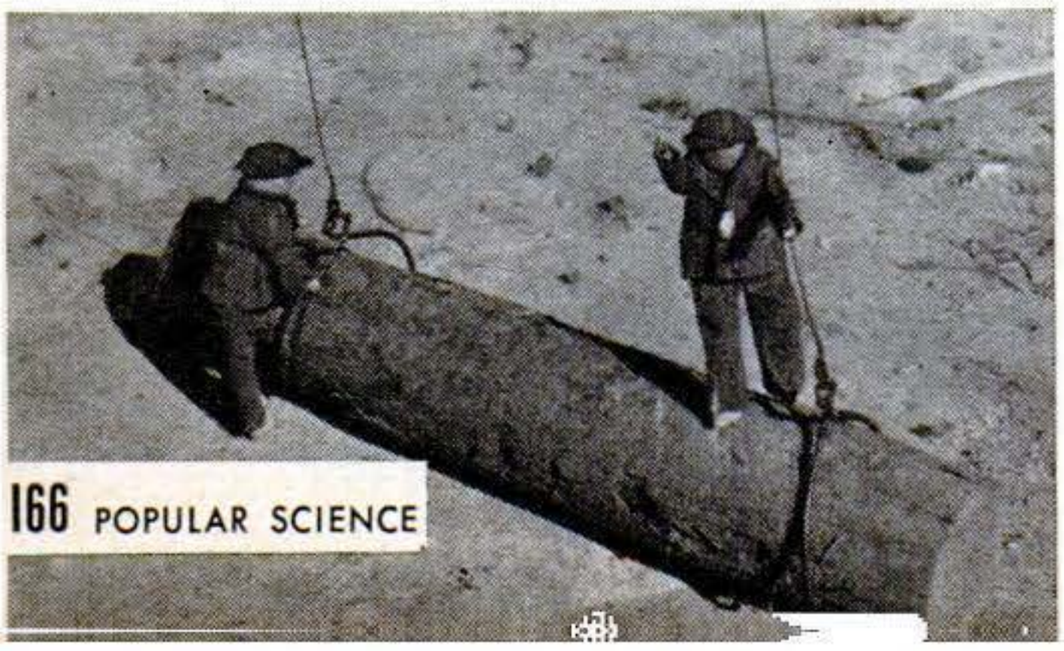
Built by a former high climber, Robin J. Smith, the donkey operates alongside his workshop at Long Beach, Calif. It weighs 350 lb., is skid-mounted, and is an accurate model at a scale of 1½″ to 1′. Engines, throttles, "steam frictions" (power-operated drum clutches), and drums all work like those on real slack-line donkeys.

The double-acting steam engines, built chiefly of cast iron, have a 1½″ bore and 1¾″ stroke. Each piston has two cast-iron rings. Valves are piston type, and roller bearings are used throughout. The boiler, 10″ in diameter and 24″ high, has 120 copper tubes. Fired by gas from city mains, it will develop 120 lb. in 30 minutes from a cold start and is safe at 200 lb. A small steam-operated injector keeps up the water level. Smith, who works for Douglas Aircraft, values the model at $2,000.



Engine throttles are by left hand, brake drums by the right. "Steam frictions" (drum clutches) are controlled by the piped box in the center. The model makes use of three separate engines.

Paul Bunyan puppets, also made by Smith, supervise the attachment of a pair of sharp-pointed tongs to a log that's about to be hauled away. His spar tree is about 150 scale feet tall.



Lines are rigged just as real loggers do. The high lead block (left) and the carriage block are aluminum castings that Smith made himself. A real high lead block may weigh up to 1,000 lb.

Copyrighted material

Hanging Lamp Fashioned in Hurricane Style

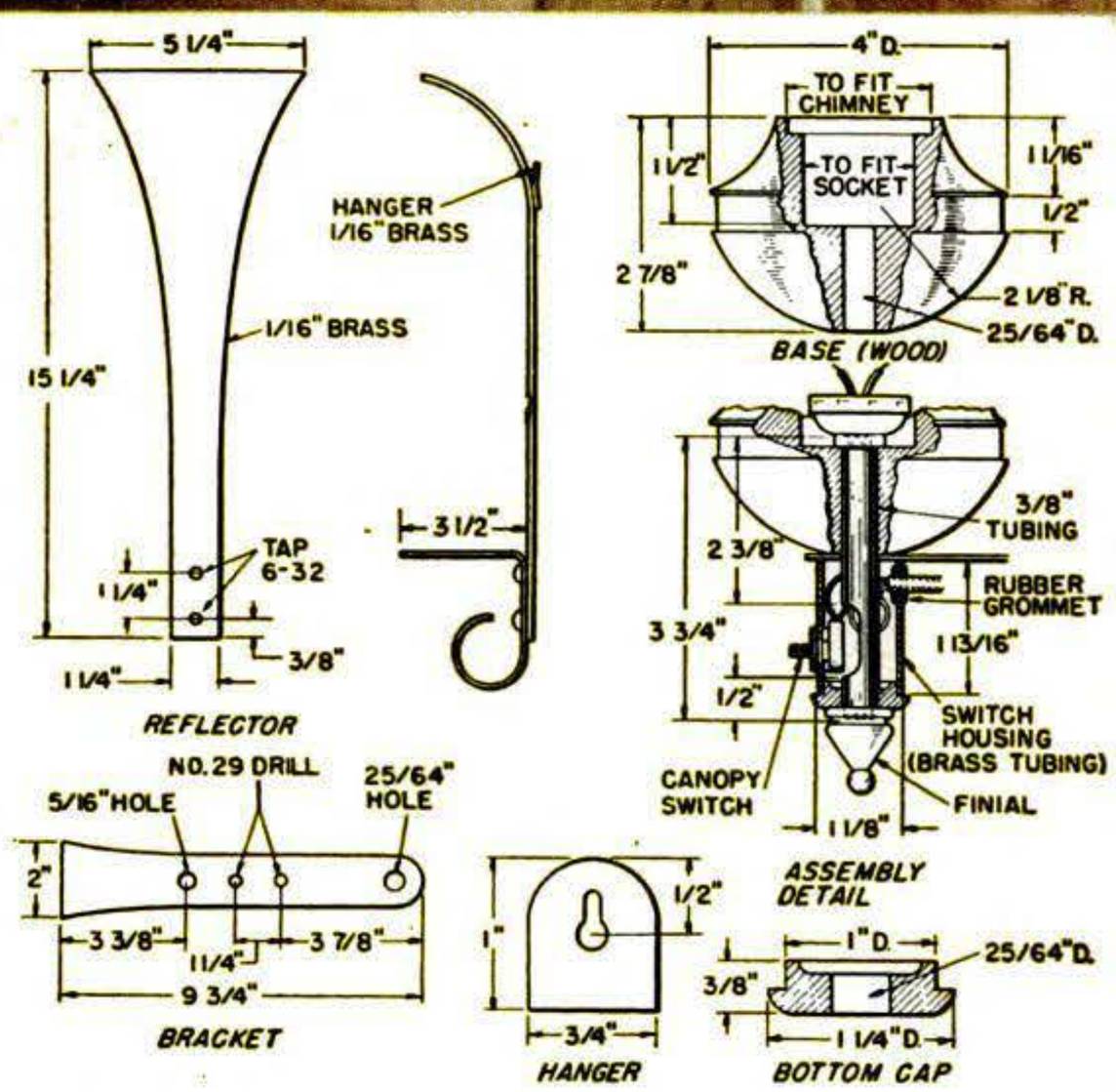
THE design of this colorful wall light was adapted from a Colonial hurricane lamp. Its overhanging reflector is lacquered brass, and the oil-reservoir section—turned from a 4¼″ block of hardwood—is enameled to resemble colored glass. A ½″ wide strip of brass encircles this turned base.

Before you start work you'll need a suitable chimney and a keyless socket, for the counterbore dimensions within the base depend upon the size of these items.

After sawing and filing the bracket and reflector from 1/16″ sheet brass, locate and drill all the holes in both pieces. Thread the small ones in the reflector 6-32. Make a 90-deg. bend in the bracket ⅜″ from the No. 29 holes. Shape the flared end into a scroll, fasten to the reflector with roundhead brass screws, cut the latter flush, and center-punch their ends. Form a freehand curve in the top of the reflector and make and solder on the wall hanger.

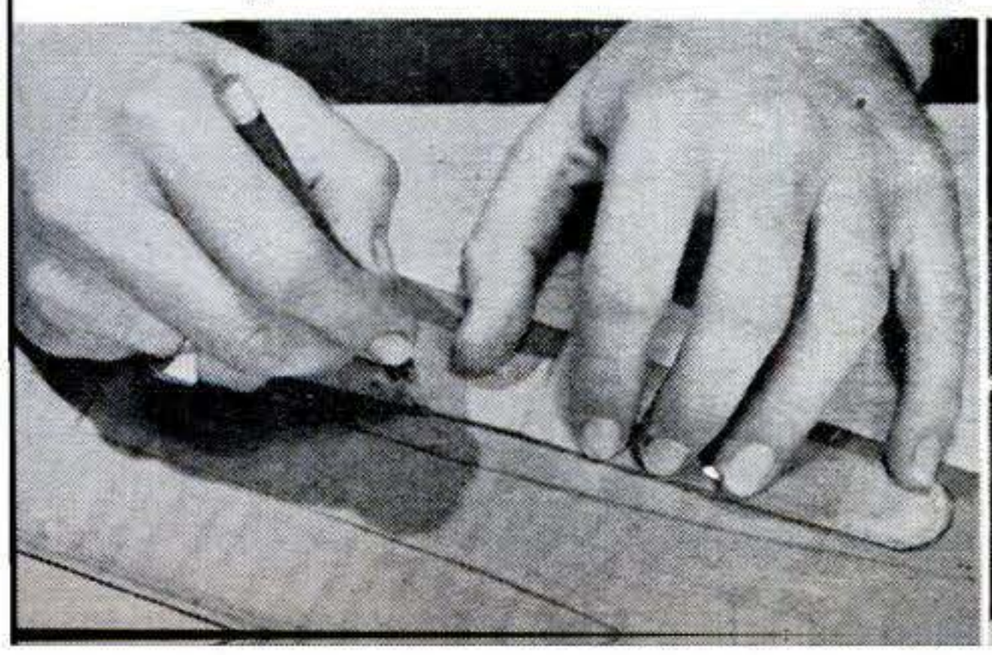
The lower assembly includes a 3¾″ length of ⅜″ tubing or a ⅛″ pipe nipple inside a 1⅞″ length of 1⅛″ brass tubing. Drill holes in the larger tubing for a line-cord grommet and for the canopy switch that operates the lamp. Thread the ⅜″ tubing at both ends and also file a notch opposite the switch to make room for it and allow entrance of the wires. Turn the end cap from 1¼″ brass rod or form it from a disk of the 1/16″ brass plate. Use a lampshade finial at the bottom. Buff all brass parts well and lacquer.

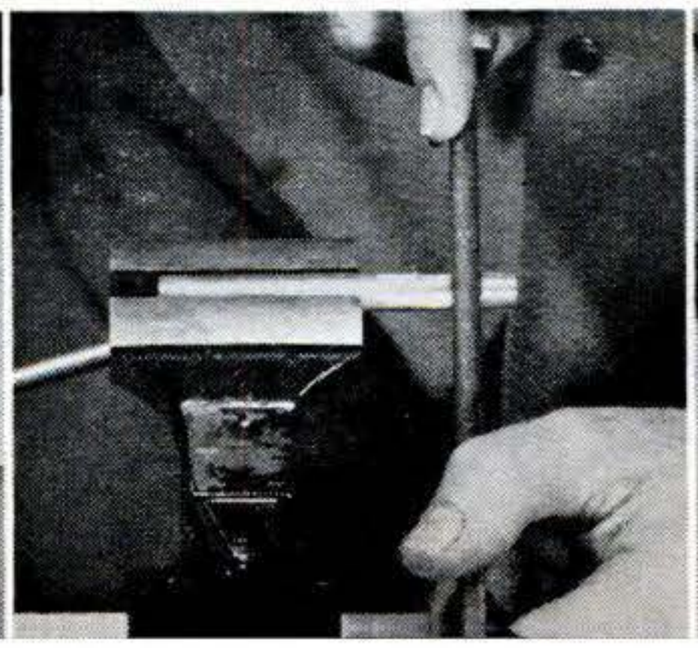
Tilt the switch at an angle, slide it into the tube and up through the mounting hole, and fasten with a bushing nut. Connect the switch and push the leads up through the small tubing. Use a grommet in the bracket cord hole.—*Bill Luther, Los Angeles.*

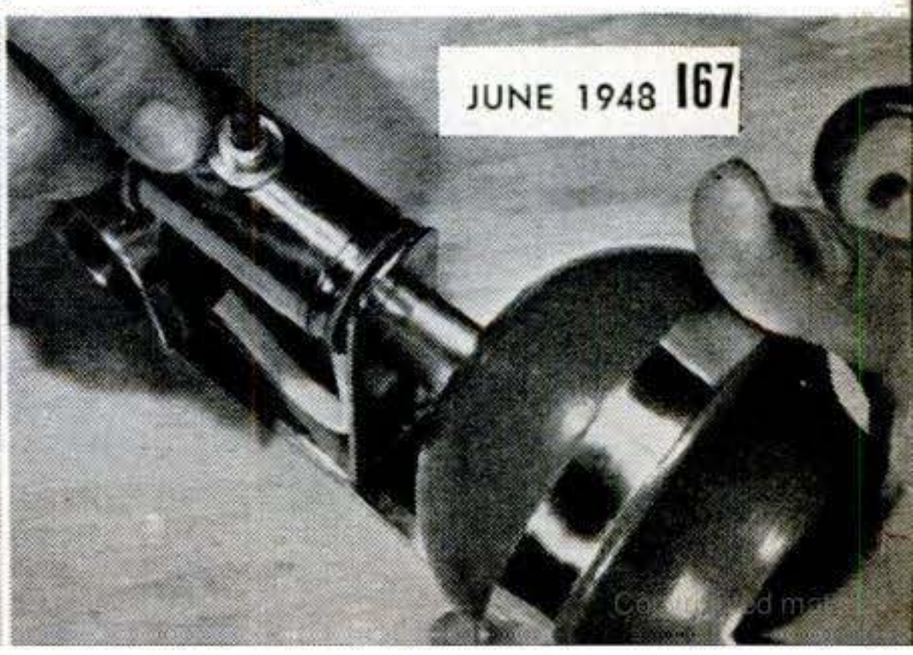


Lay out the bracket, reflector, and hanger on 1/16″ sheet brass, using cardboard templates. File a slot (center) in the ⅜″ tubing to give space for installation of a canopy switch.

Assemble the lamp by sliding the ⅜″ tubing through the bracket and wood base. Thread it into the socket cap, connect the wires, and snap the shell into place in the cap.







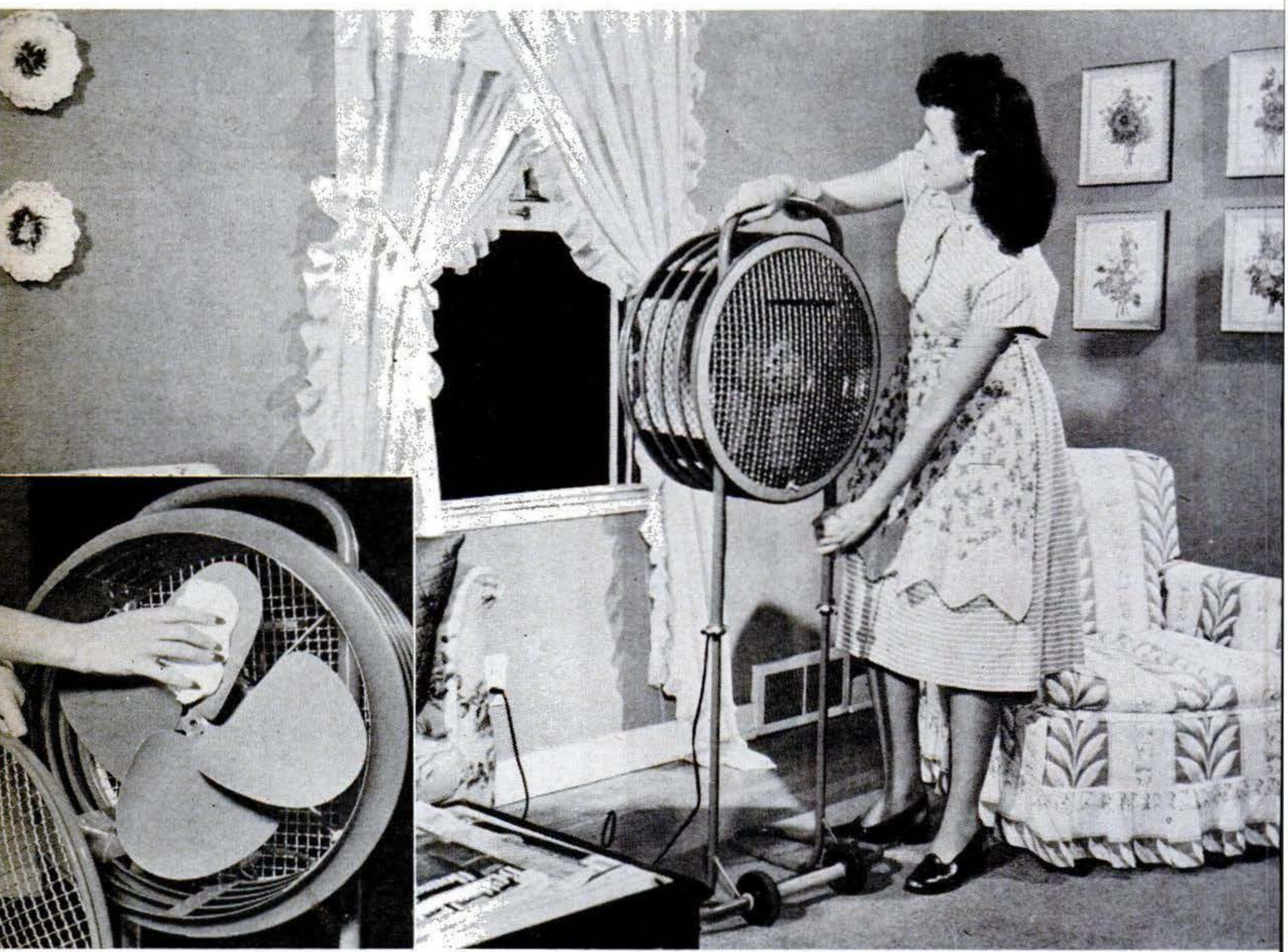
Buying Packaged Breezes for Summer Comfort

The sweltering season is coming up but so is a whole new crop of fans.

By Arthur C. Miller

SUMMER doesn't have to leave you as limp as boiled spaghetti if you learn how to live with the heat waves. Though there isn't much you can do about the outdoor climate, the proper electric fan in a house or office will give orders to the thermometer and make it obey.

The amount of control that one can exercise over the indoor weather depends on a number of factors. Dollars and cents are two important ones, but there are others, and it will do no harm to give them a little thought before resigning yourself to spending all



Capacity of the Mobilaire Ⓣ is rated at 3,000 c.f.m. The front guard snaps off for cleaning.

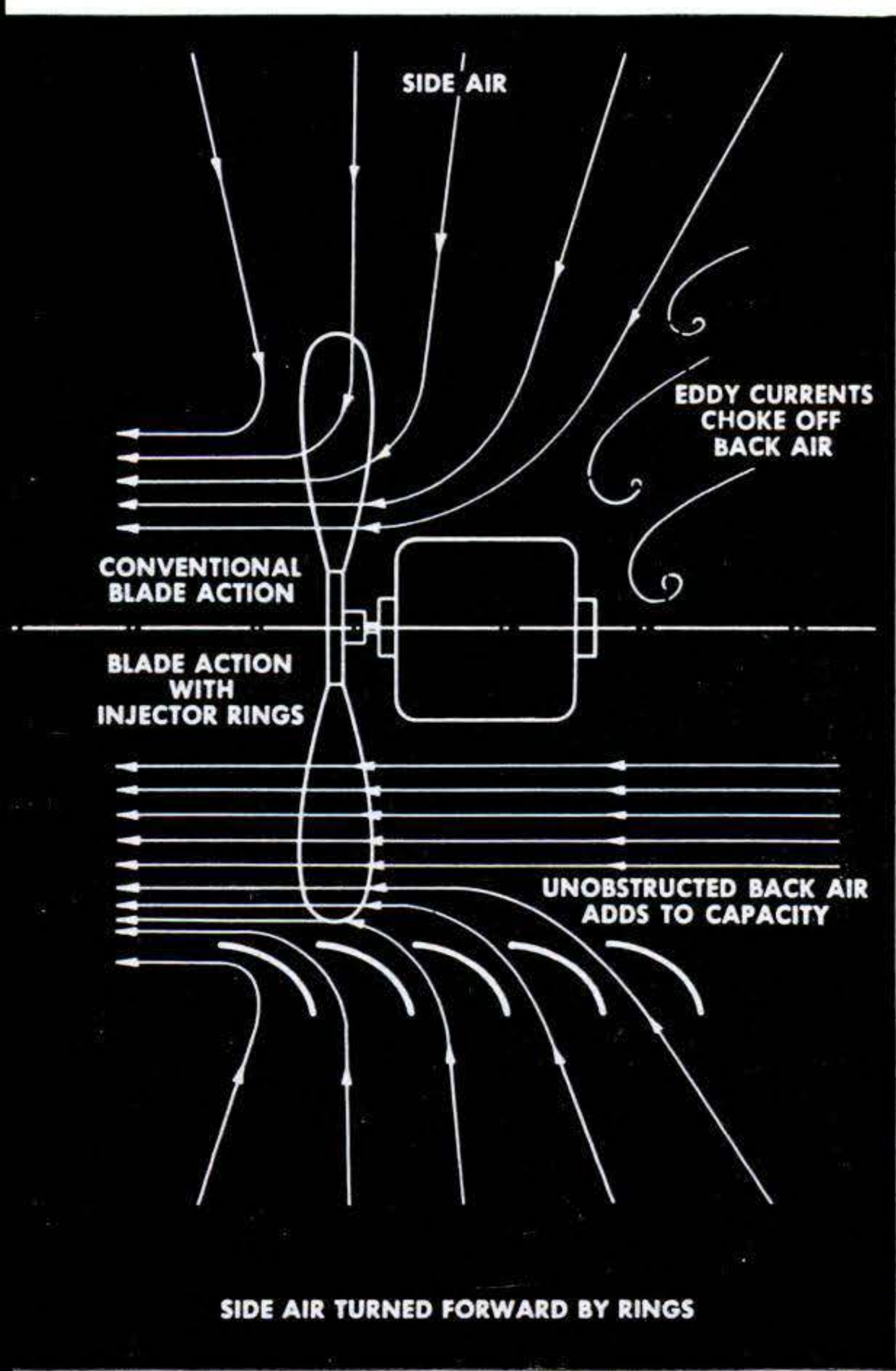
Copyrighted material

your free time in an air-conditioned movie.

Your body doesn't make it easy for you to keep cool, because, like all operating machines, it generates heat. As the temperature of the air approaches that of the body, a hot envelope is formed that prevents the body from dispelling its heat fast enough to keep you cool. To feel comfortable, you have to break this envelope.

For five bucks you can give it a slight nudge—for that is about what you'd spend on a 6″ or 8″ nonoscillating fan with a shaded-pole AC motor. At close range one of these fans is capable of moving the air enough to give a cooling effect. While they won't refresh a room, or even do you much good if you move a few feet away, they are adequate within their limitations.

Next in the price scale is usually the 10″ job. Many of these are of the oscillating type—i.e., they turn from side to side as the blades revolve. They come a little higher (approximately $15 to $20) and do a some-

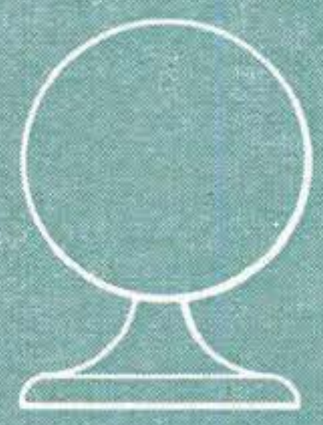


Here's how injector rings bring in back air.

BASIC FAN TYPES

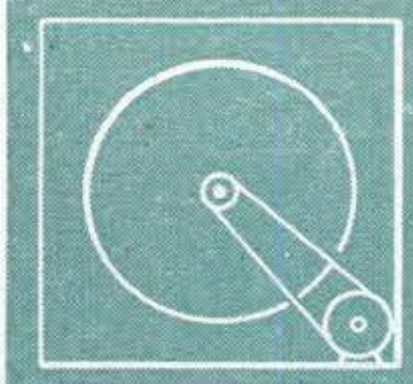
SMALL HOUSEHOLD FANS

Air Displacement: 300-600 c.f.m.
Blade Sizes: 6″-10″
Rating: 30-40 watts
Price Range: $6-$15



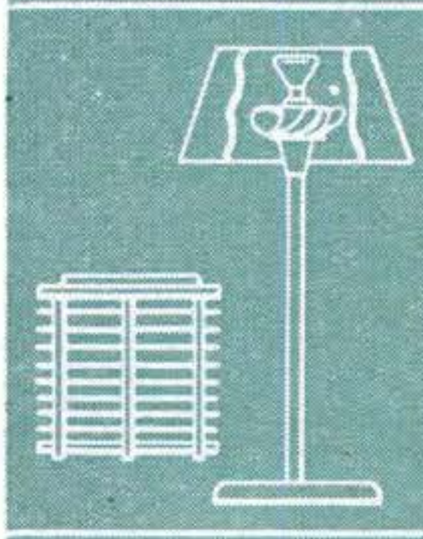
LARGE HOUSEHOLD FANS

Air Displacement: 700-1,700 c.f.m.
Blade Sizes: 12″-16″
Rating: 50-90 watts
Price Range: $15-$35



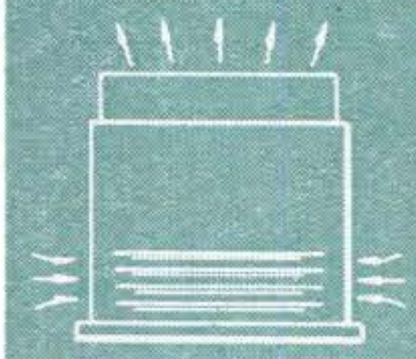
EXHAUST FANS

Air Displacement: 4,000-16,000 c.f.m.
Blade Sizes: 30″-48″
Rating: 250-550 watts
Price Range: $90-$190



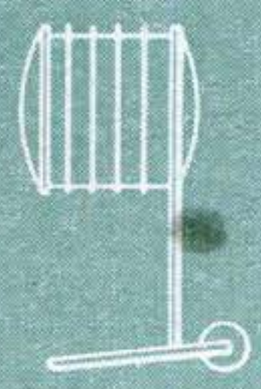
COMBINATION FANS

Air Displacement: 500-1,500 c.f.m.
Blade Size: 10″-12″
Rating (Motor): 40-100 watts
Price Range: $35-$90



FLOOR FANS

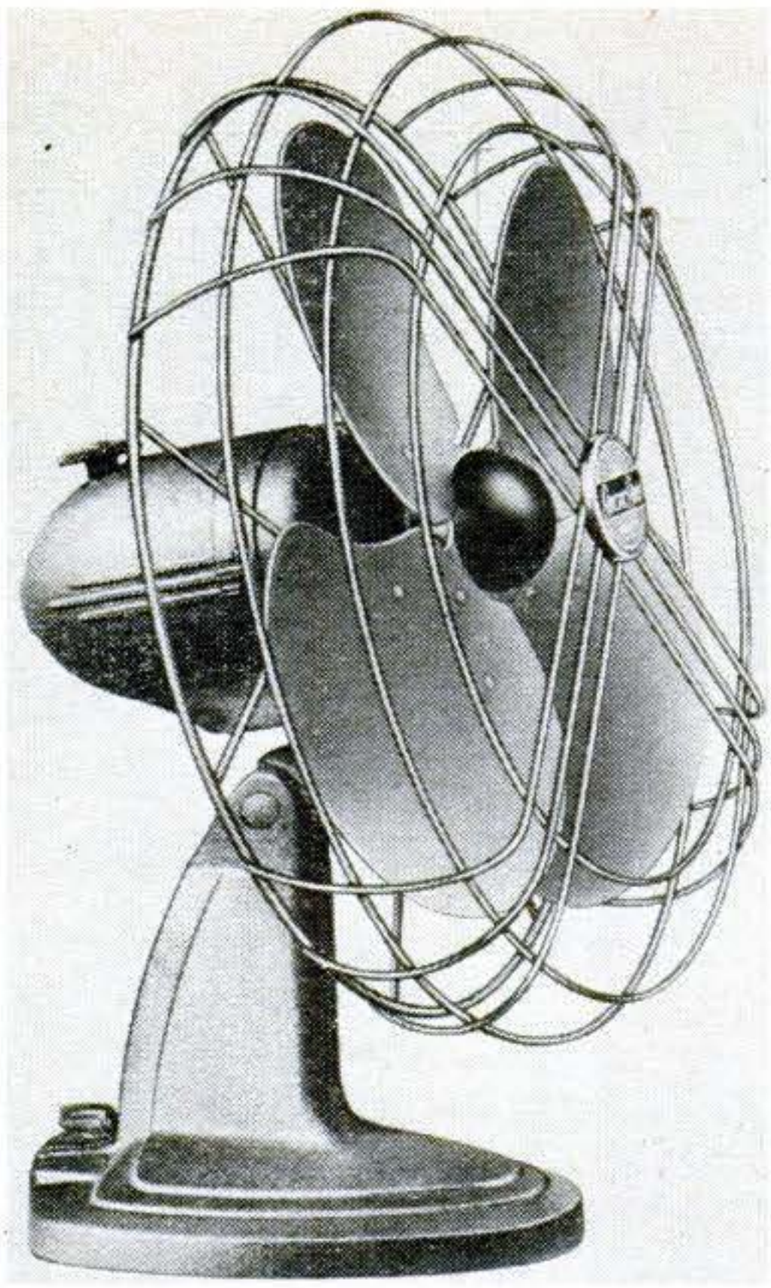
Air Displacement: 900-3,000 c.f.m.
Blade Size: 12″
Rating: 80-130 watts
Price Range: $30-$65



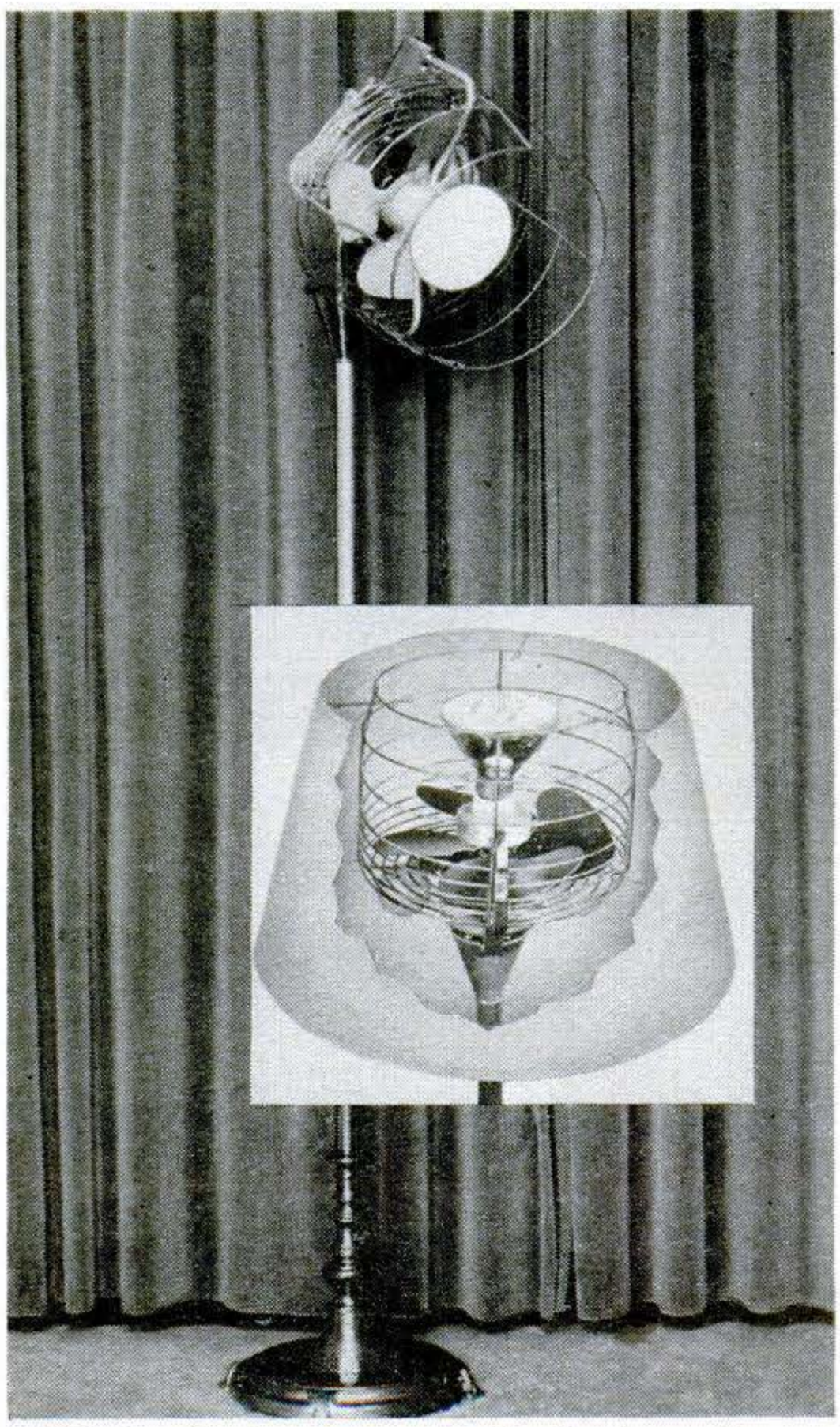
INJECTOR-RING FAN

Air Displacement: 2,250 c.f.m. Low
3,000 c.f.m. High
Blade Size: 16″
Rating: 100 watts
Price: $70

Copyrighted material



Streamlined, but still standard, this type of fan is the leading personal and home cooler.



With its shade removed, the Fanlamp Ⓣ may be inclined as shown and used for direct cooling.

what better job in that they will cool two or three people in a portion of a room.

Assuming that your needs can be satisfied by a small fan, here are some of the things to look for when you go buying:

Does the fan have a convenient carrying handle? Small fans are apt to get pretty hot after they've been going for a while, and a handle will save your fingers.

Does it have a tilt adjustment? When you want to keep the airstream from playing with the papers on your desk, a tilt adjustment with a wing nut gives you a better choice of fan positions.

How is it lubricated? New developments in metallurgy have given us porous metal bearings. Many fans have sealed-in, lifetime lubrication; others provide oil wells that hold enough lubricant for a season or more. Those that have neither must be oiled fairly frequently.

How many speeds does it have? On less humid days you will not require the strongest stream to puncture the hot-air envelope, so there is a definite advantage in having at least two speeds.

Is the blade well guarded? Since we're all subject to fits of absent-mindedness, there's no sense in buying a knuckle duster.

Does it run quietly? Practically no fans run quietly enough after they've been used for a year or two, so if a new one has an objectionable hum or rattle, steer clear of it.

Unless you're a person who spends his days rooted to a desk and his evenings in one armchair, you probably ought to think of cooling a room or house rather than just one or two occupants. Most city people find there is very little difference between indoor and outdoor temperature, even at night, so that cooling depends upon keeping the air in motion and thus preventing the humid envelope from clinging to the body. The size of fan that will do this inside any room or house depends upon the dimensions of the structure. Size in cubic feet is calculated by multiplying a room's three dimensions. Thus if the ceiling is 10′ high and the floor space is 10′ by 15′, the quantity of air that the room holds is 1,500 cubic feet.

Now you can move 1,500 or even 15,000 cubic feet of air simply by wiggling a pencil —if you keep it up long enough. When it comes to a particular fan, you want to know how long it will take it to circulate a given quantity of air. Under most conditions a fan will keep a room comfortable if it circulates

Copyrighted material

the total volume of air once every two minutes. Manufacturers generally list the air capacity of their fans in cubic feet per minute (c.f.m.), and this is an important thing to look for when making a purchase. This figure should be about half the cubic content of the room that you want to cool.

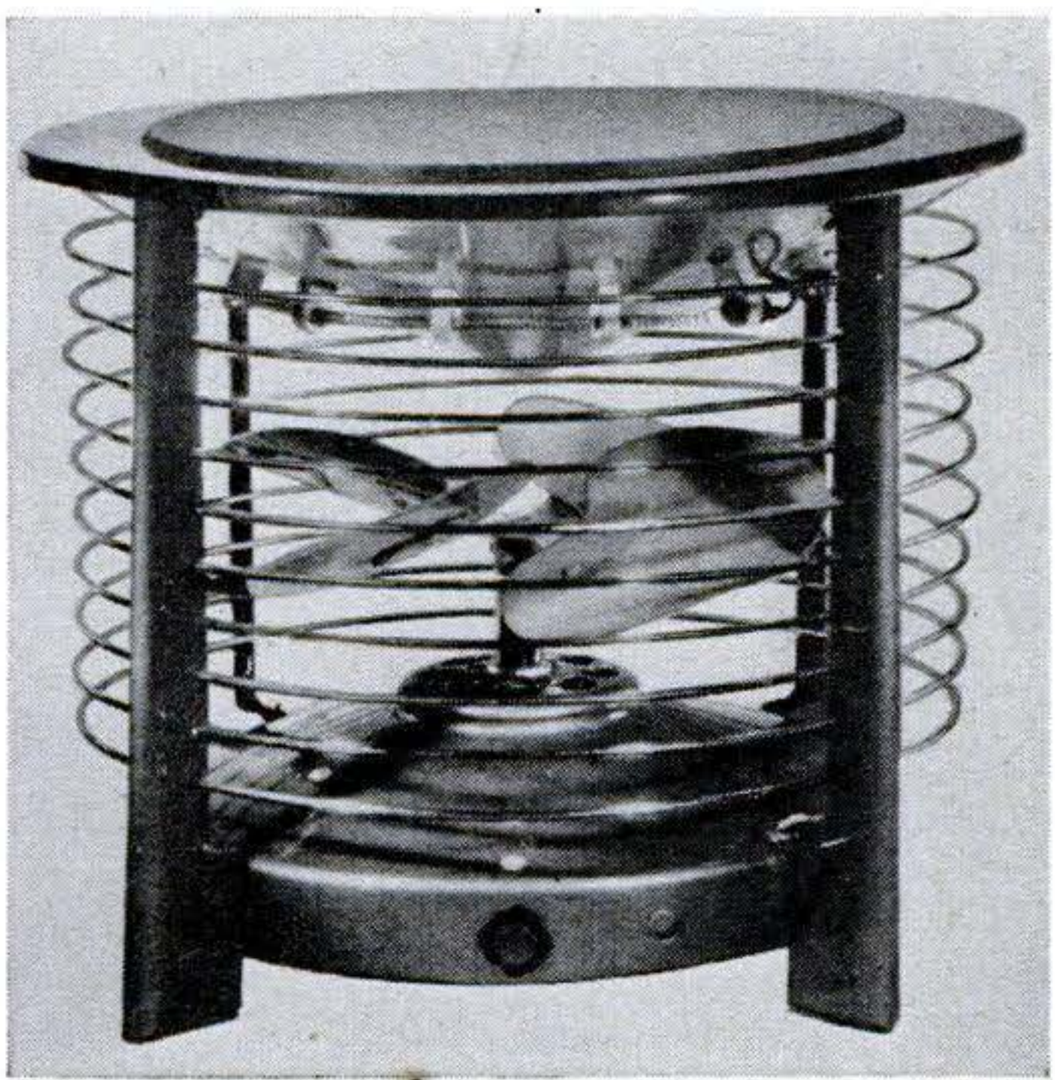
Some fans are based on the sound observation that the coolest air is lurking about under your feet. This cool air normally stays down below while the warm air rises and settles around you like a fog. Vertical fans that operate from floor level not only stir up the air around you, but also exchange it for the cooler air near the ground.

Combination fans almost speak for themselves. Two models shown in these pages are the Walton Fanlamp Ⓣ and the LeJohn Circulator Ⓣ. Both of these are vertical fans; the former incorporates a lamp, and the latter a heating element. The fan and lamp combination, which retails for $75 up, is a handy thing for a small office or reception room, and good to have over a card table when the session gets smoky. With the lampshade as a funnel, smoke is drawn quickly up to the ceiling and can escape through the top of an open window. Lamp and fan operate independently.

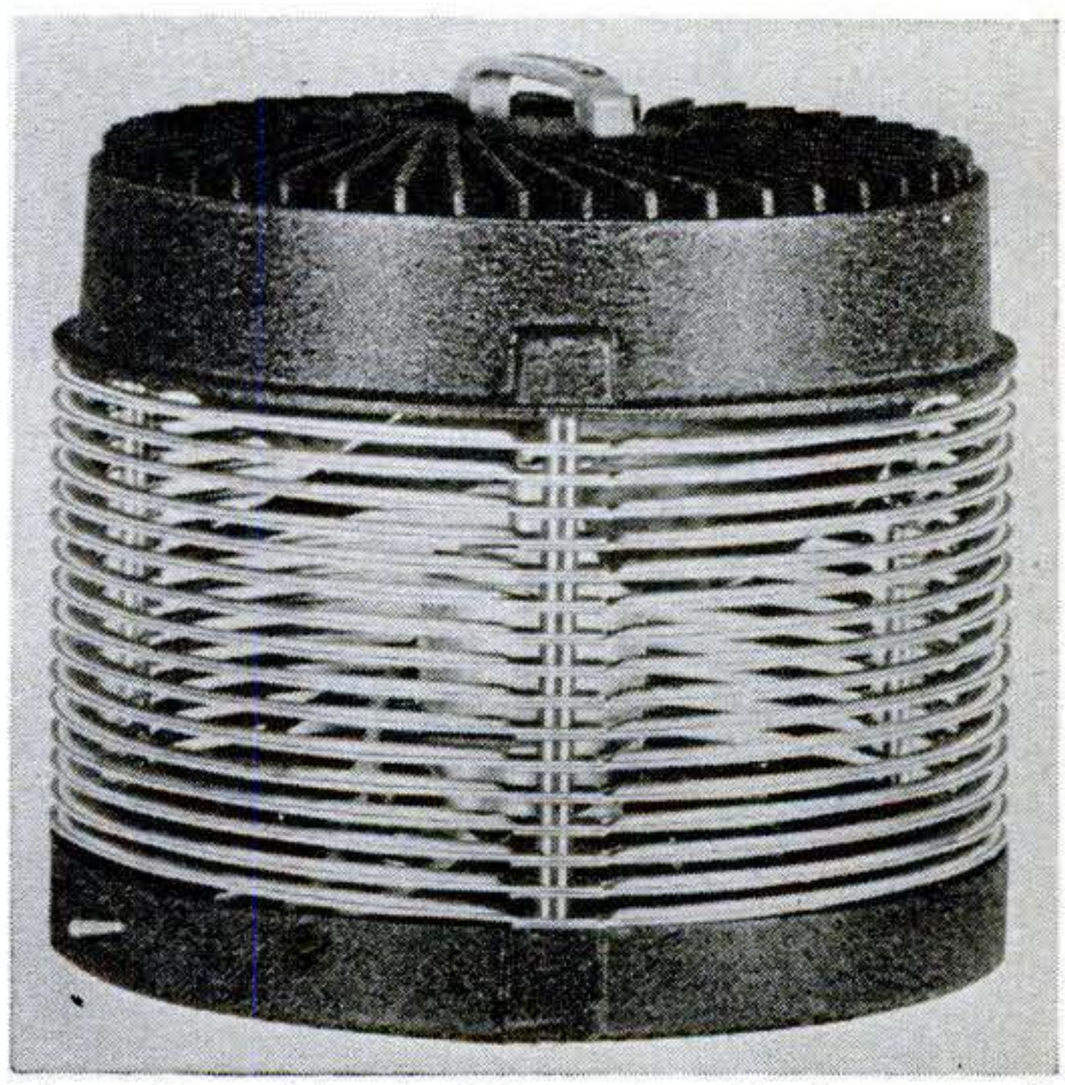
For the next few months the heating element in the LeJohn combination is not likely to interest you much, but when the first nippy days start coming back you may enjoy a few warm breezes. Fan and heater are independent, and the whole works come to $35.

Suburbanites and country dwellers face a somewhat different problem when it comes to cooling a home. Wherever the night air is cooler than the accumulated heat inside the house, you can get maximum relief from summer weather by bringing the outside air indoors. There are two types of fan that will do this job well—the portable pedestal fan, and the fixed attic exhaust. Westinghouse has developed an injector-ring fan that will work well in a medium-sized house or apartment. When placed 3′ from an open window, the Mobilaire Ⓣ exhausts the hot house air, exchanging 6,000 cubic feet of it every two minutes for cooler outdoor air, which is drawn in at other windows. The 16″ laminated-plastic blades used in this unit are surrounded by five curved annular rings called air-injector rings. These rings are said to increase fan efficiency by approximately 30 percent over conventional fans. Normally a fan pulls air in from the sides only and sets up interfering currents that block back air. The injector rings regulate the side air stream and give the back air a clear channel. Although it looks hefty and does a man-sized job, the Mobilaire weighs only 35 lb. and can be moved about easily on its rubber-tired rollers.

With hot air rising all day, you can imagine how much of it has accumulated in the attic by nightfall. If this were cleared out, the slightly cooler air below could rise, allowing still cooler air to come in. Prices for good attic fans range from about $90 to $200, although you can go much higher

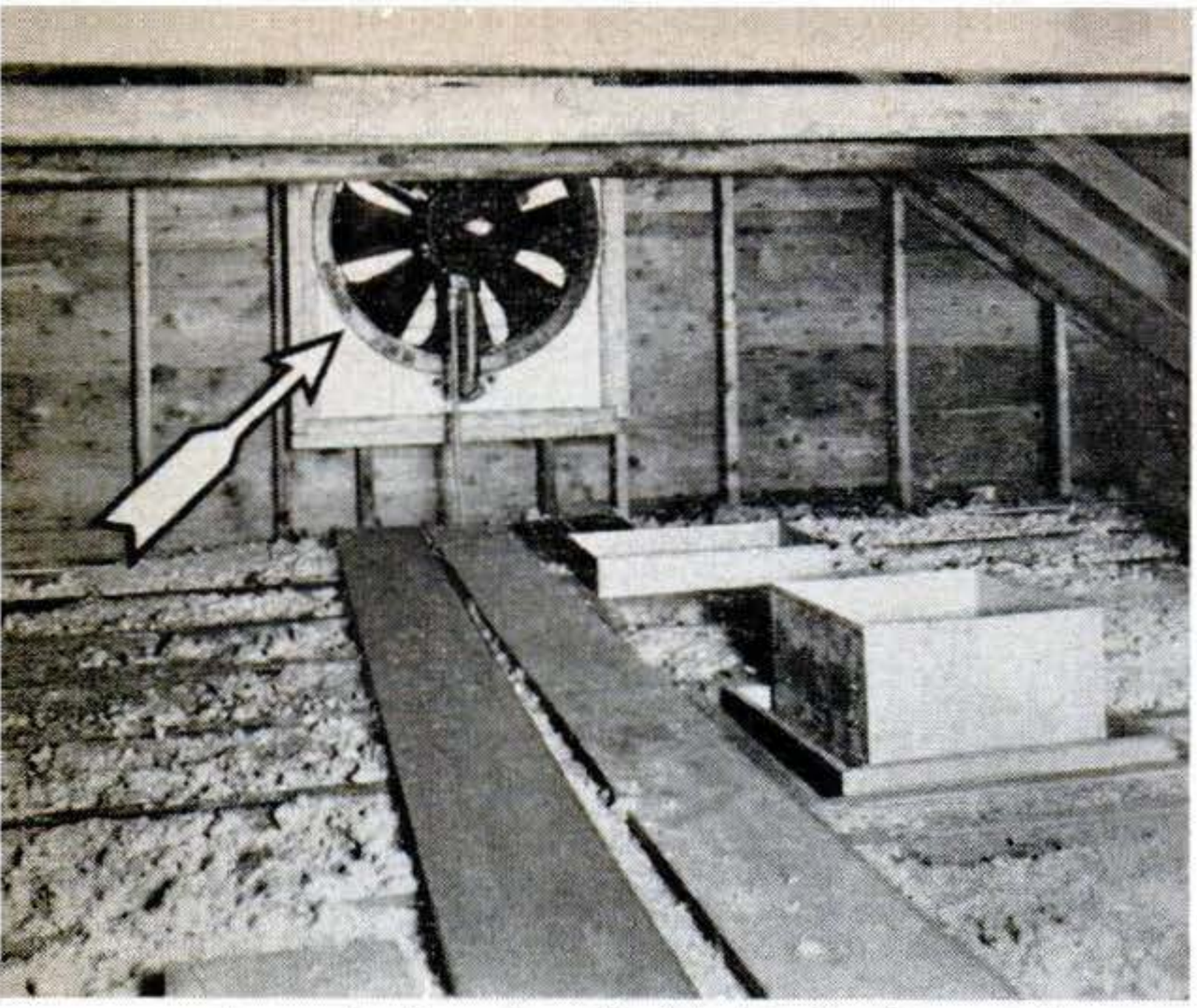


The heating element under its lid allows this LeJohn circulating fan to blow hot or cold.

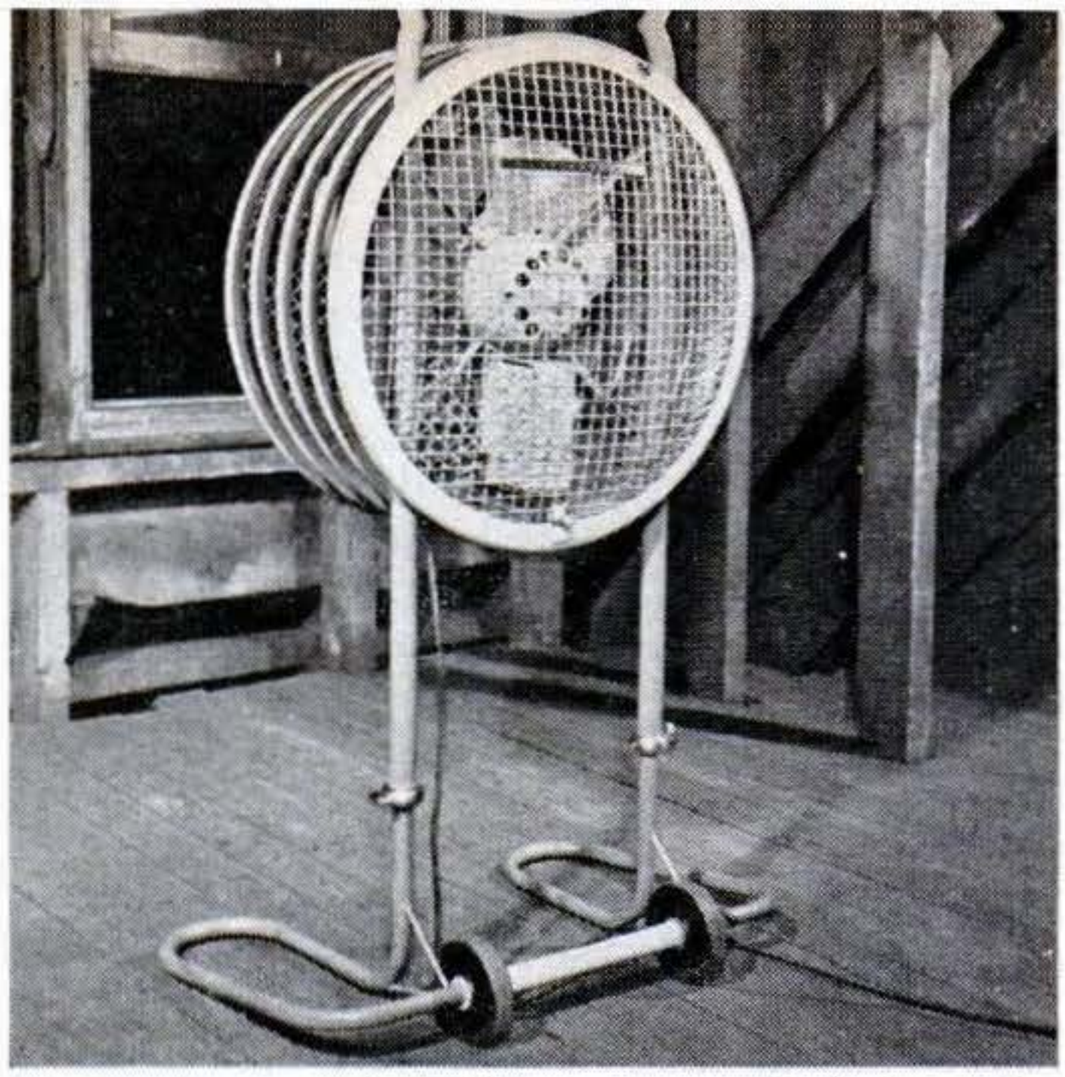


Floor fans, like the MotionAire Ⓣ above, work by circulating cool air vertically from the floor.

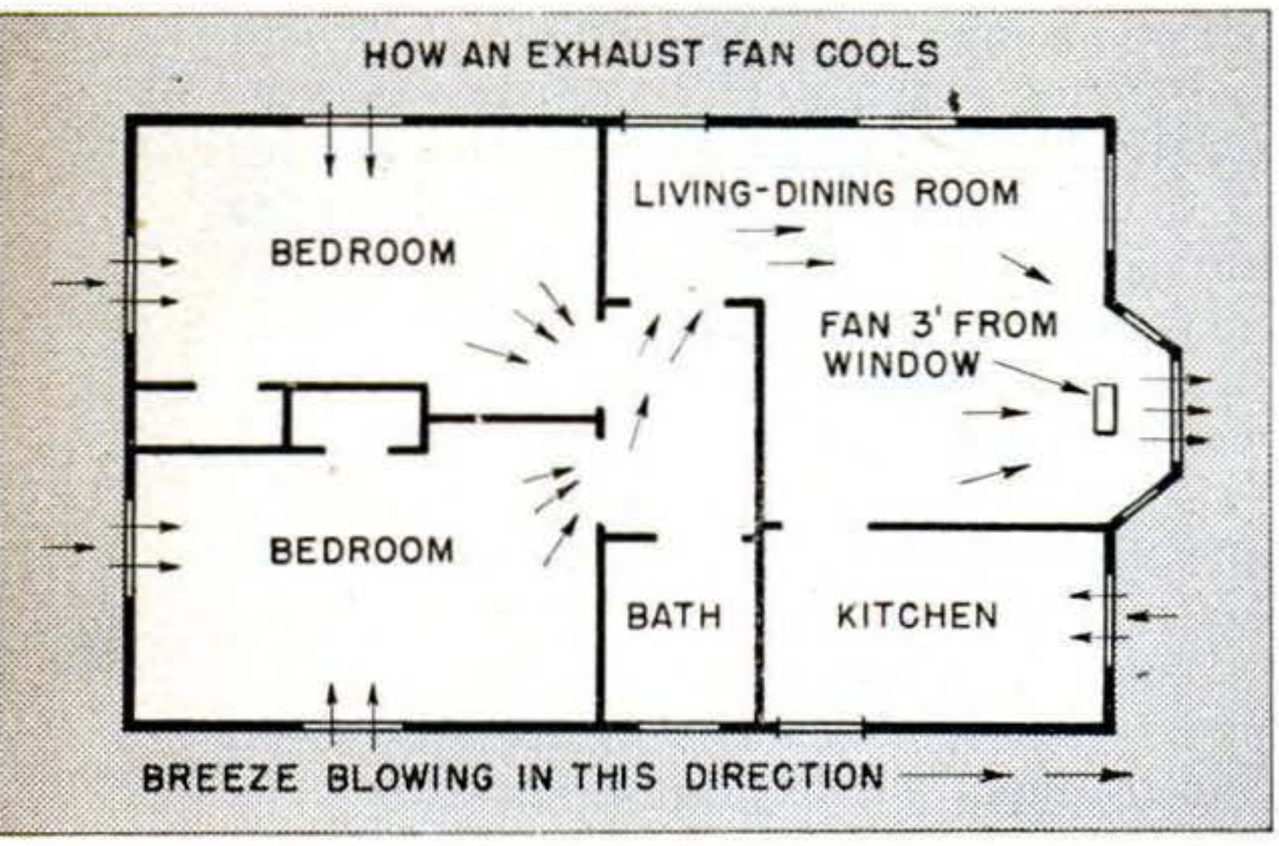
Copyrighted material



An attic fan, installed behind a louvered opening, exhausts hot air from the house at night.



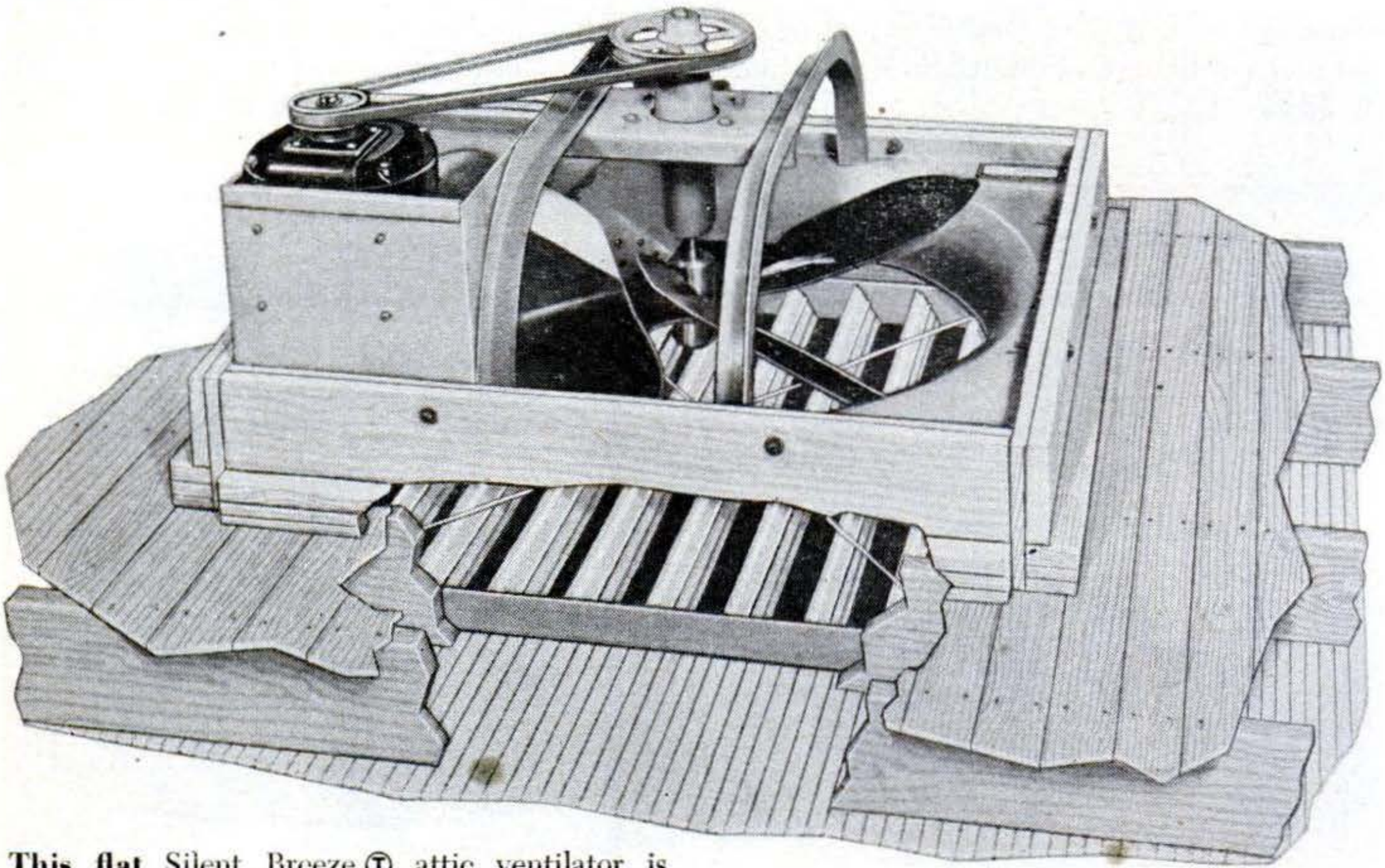
No permanent installation is needed when the Mobilaire Ⓣ is used as an attic exhaust fan.



for special installations. Size again depends upon the cubic content of the house you're interested in cooling.

Some attic fans are installed (with their blades in a vertical plane) behind louvers or shutters. Others are installed horizontally over a ceiling hatchway, exhausting through louvers or other attic openings.

The diagram at the left shows how air currents travel through the house; an exhaust fan draws heat from other rooms, thereby encouraging cool air to rush in and make the whole building more comfortable both by day and by night. END

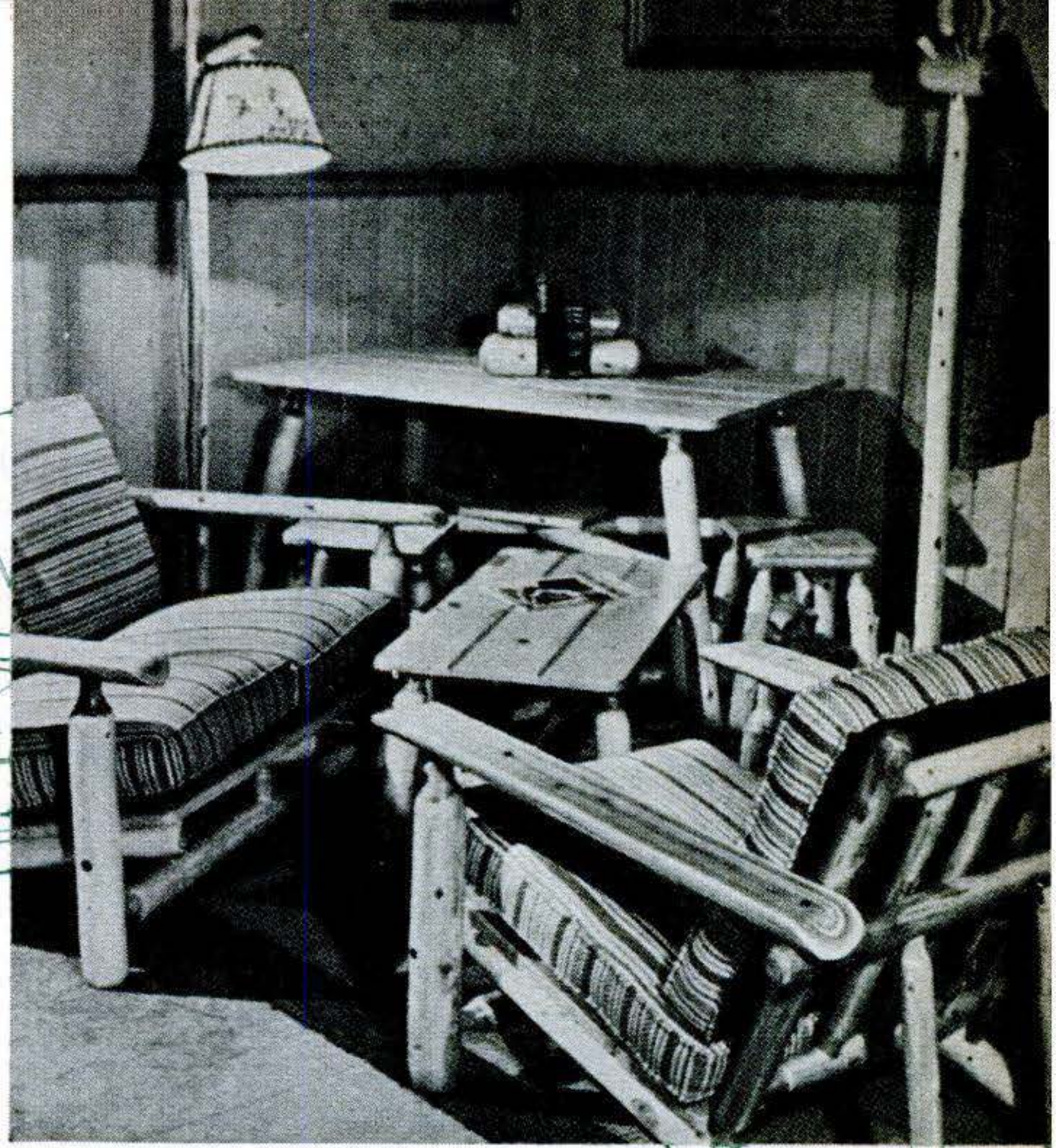


This flat Silent Breeze Ⓣ attic ventilator is furnished complete with housing and shutter.

Copyrighted material

Anyone with a lathe can build rustic-style pieces for cabin, home, porch, or lawn.

Furniture From the Forest



This room was furnished from the woods. Only the cushions and flat boards were bought.

By Geoffrey T. Marris

MOST rustic furniture has a shaggy, backwoods look that will win no beauty prizes. This set, which can be made without difficulty from small cedar logs, has light, clean lines that suit modern tastes. While a wood lathe will speed up the job, you could turn out the smaller pieces with hammer, saw, bit brace, and drawknife.

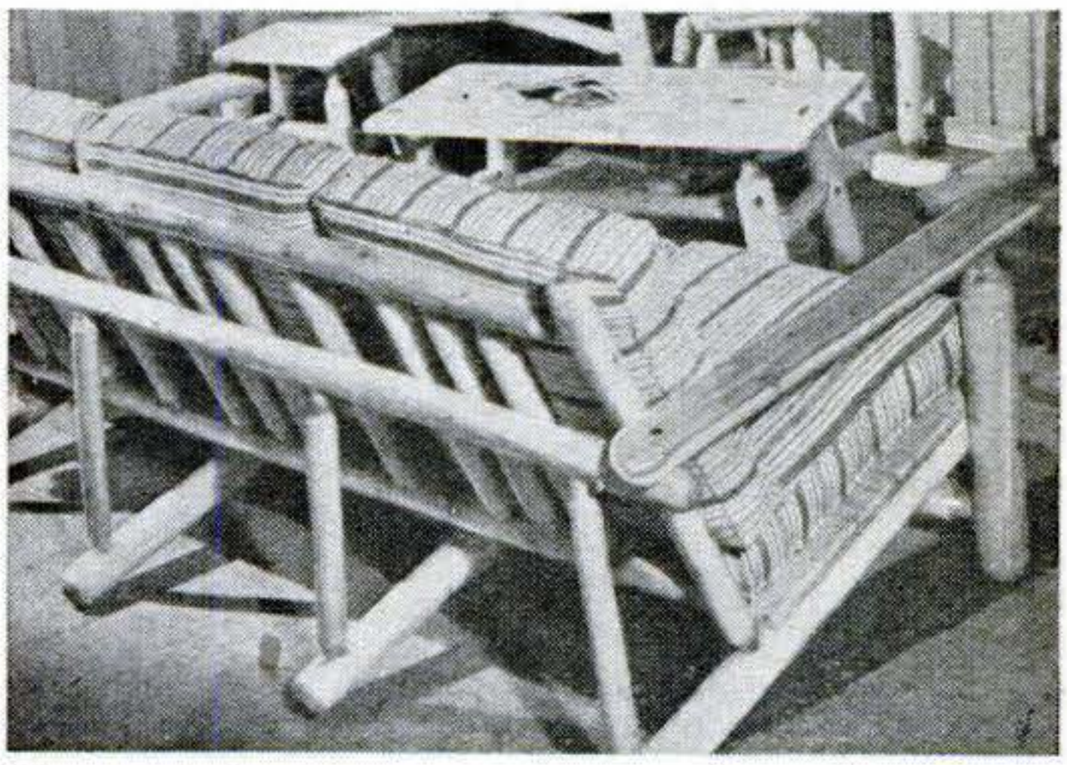
If you live in a town or city, materials can often be had by dickering with a farmer or landowner. Try to locate a dense second growth of cedar. From this you can probably cut sufficient dead material that's already fully seasoned. Select trees 1½″ to 3″ in diameter and cut them into convenient lengths. If there are no dead trees, cut green ones and dry thoroughly before use.

White cedar is the best material, spruce an excellent second choice. The grain of the latter may raise, however, unless the wood is very dry. For flat surfaces, such as chair arms, use red or yellow knotty pine. This blends well with either cedar or spruce when a natural finish is applied.

Begin with something relatively simple; for instance, a stool. This accomplished, make a bench, treating it as an elongated stool. From there, progress to a coffee table —simply a wider stool. By this time, you will have acquired the feel of the work, and may choose from the entire field of rustic furniture. The variety of possible pieces is almost endless.

Let's see how a stool is made. From your stock select and cut one 2½″ log 14″ long, four 2¼″ pieces 17½″ long, two 2″ pieces 12″ long, and one 1¾″ piece 13½″ long. All diameters are of course approximate. In assembling vertical members place the smaller end at the top.

Put each piece in succession in a vise and peel with a drawknife. Remove only

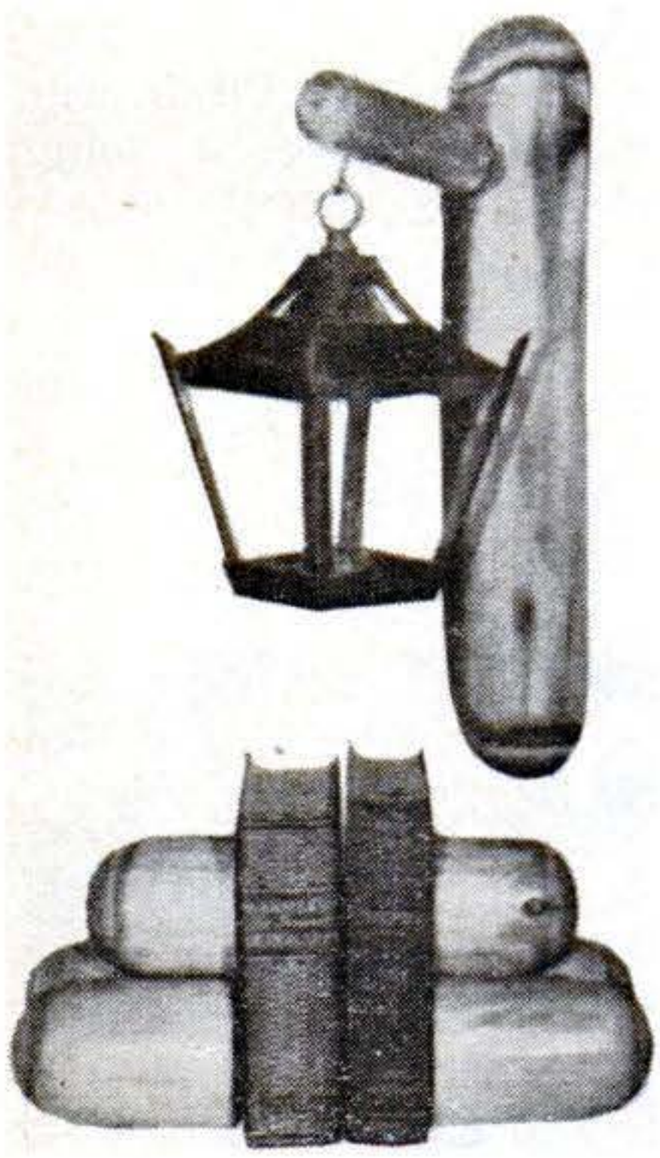


Tenon joints secure most members, but where two pieces cross, carriage bolts should be used.

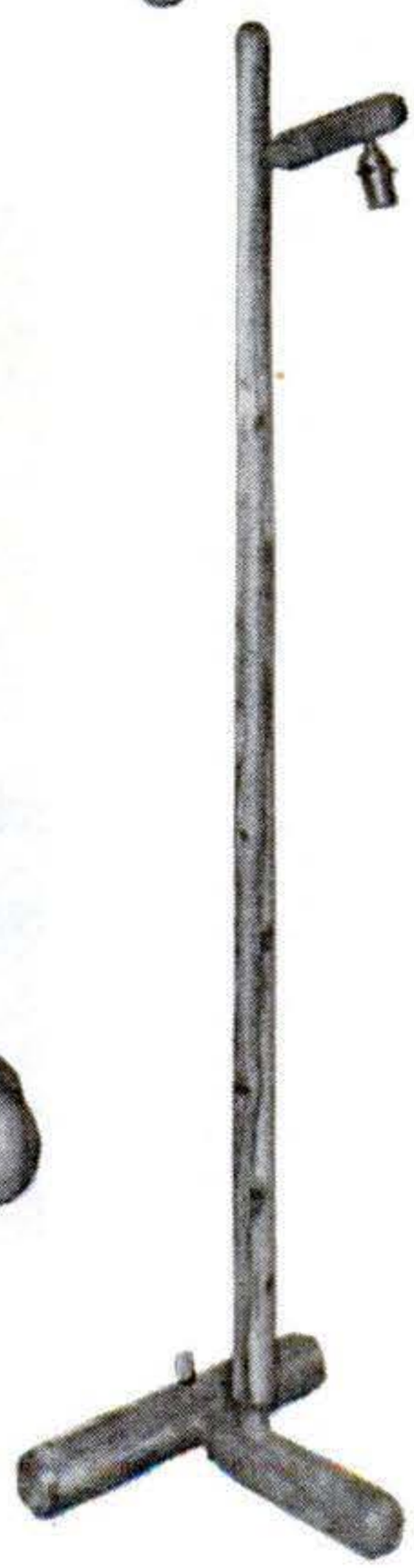
Copyrighted material

A table is just a big version of the bench. In turn, each resembles the small stool below.

Cushions for the chair on facing page are 21" by 25" and 21" by 21", each one being 4" thick.



Small pieces may also utilize cedar logs. The book ends above were assembled out of scrap left over from several of the large projects.



the bark and a veneer of sap wood. Be careful to keep the blade from digging in. Cut off any large hard knots with a chisel and smooth with a small plane. This done, the poles are ready for the lathe.

Using a tailstock support, round off each end of the 14" piece. I found this easiest with a very sharp 1" flat chisel, ground to a slightly sharper angle than normally used for bench work. In fact, at no time during the building of this furniture was any other chisel used.

Treat the four 17¼" pieces—the legs—in the same way, except that a dowel 1⅛" in diameter is turned on the smaller end. Make each dowel about ½" longer than the depth of the hole into which it is to be fitted. Turn similar dowels on each end of the three bracing pieces. Sand all the pieces smooth before removing from the lathe.

Now cut the two 1" by 6¾" by 13½" seat boards to size. A slight chamfer on the abutting edges will improve the appearance of the finished article.

Saw or split the 14" pole down the middle and smooth the flat faces. Attach under the seat boards with glue and 1¾" flathead screws. When the glue has dried, trim off the protruding ends of the crosspieces. Also round the upper edges of the seat. Fill the countersunk screw holes with composition wood and sand smooth.

Drilling for the dowels is the trickiest job of all. Put the seat face down on the bench and mark centers for the leg-dowel holes. Set a bevel square at 8 deg. off the vertical, line the brace and bit so it is leaning outward at an angle of 98 deg. with the seat, and drill until the glue line is reached.

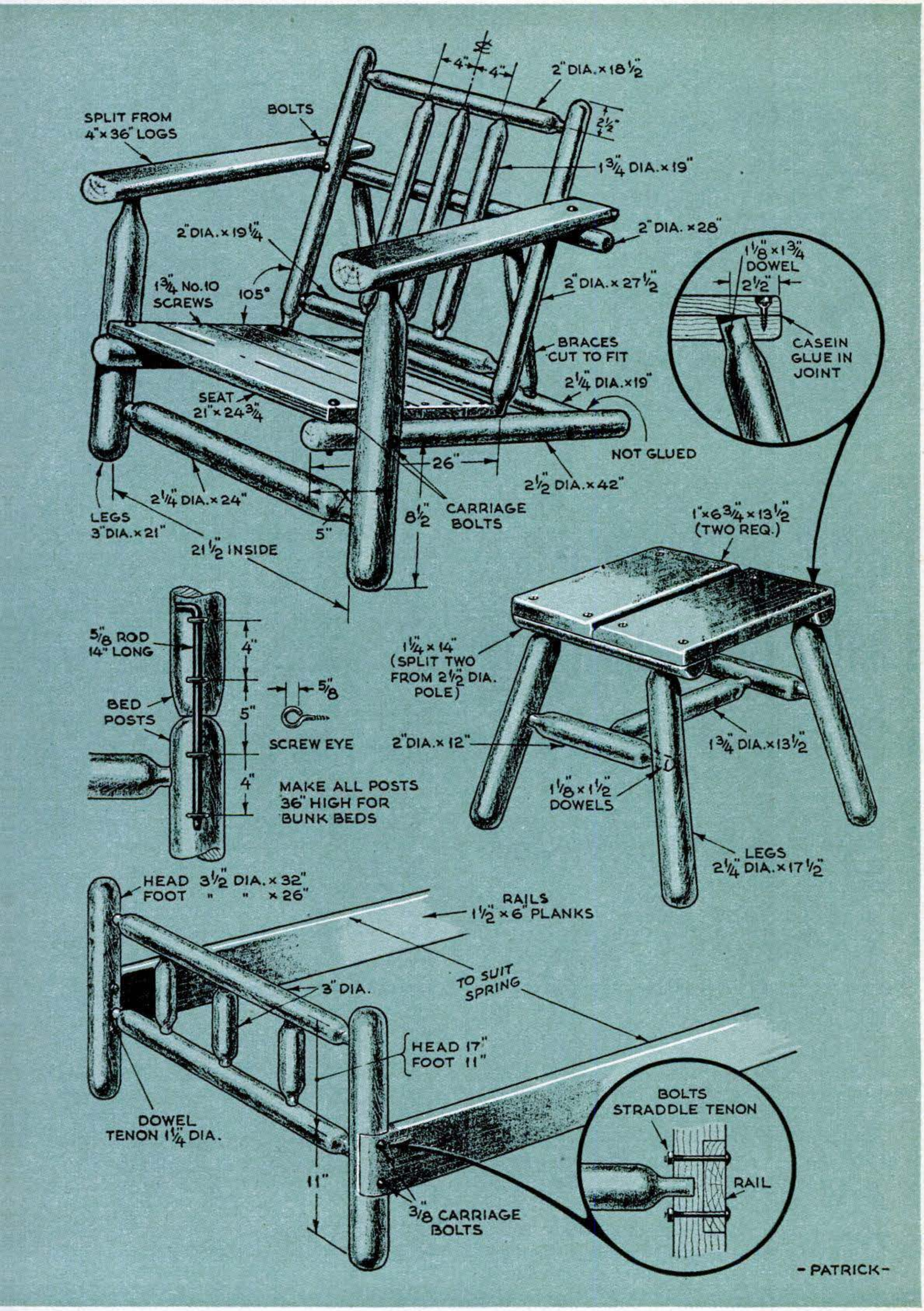
Drill the holes in the legs half way along their length, leaning the brace 8 deg. toward the dowel end. Drill the two side braces with the bit at 90 deg.

Put glue in the dowel holes and assemble the stool. When the glue is dry, check to make sure the legs are square on the floor. Three coats of clear lacquer, sanded lightly between coats, complete the job.

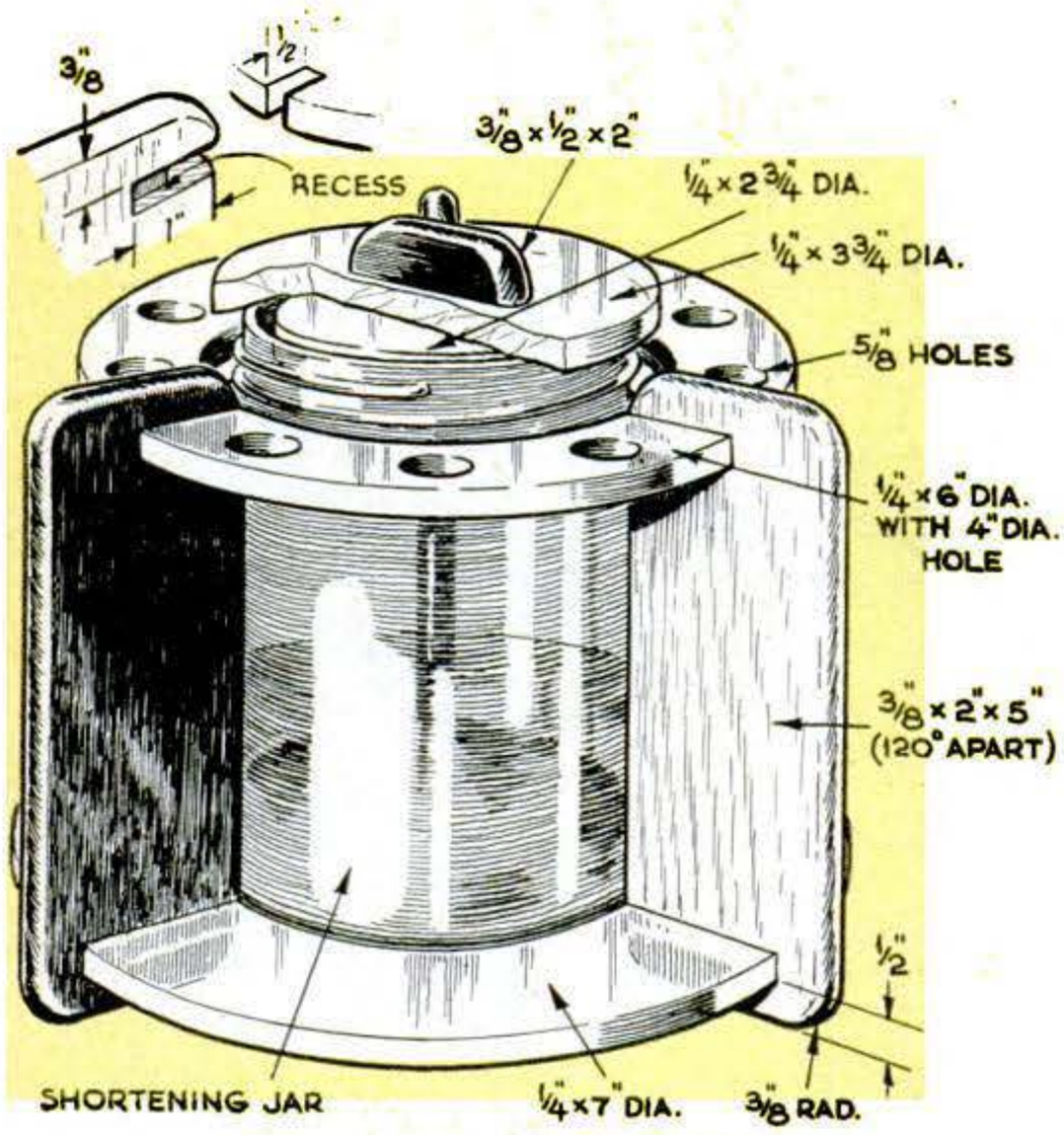
You're now ready for something more ambitious—a bench, table, chair, bed, or other item, chosen from the accompanying examples or designed on your own.

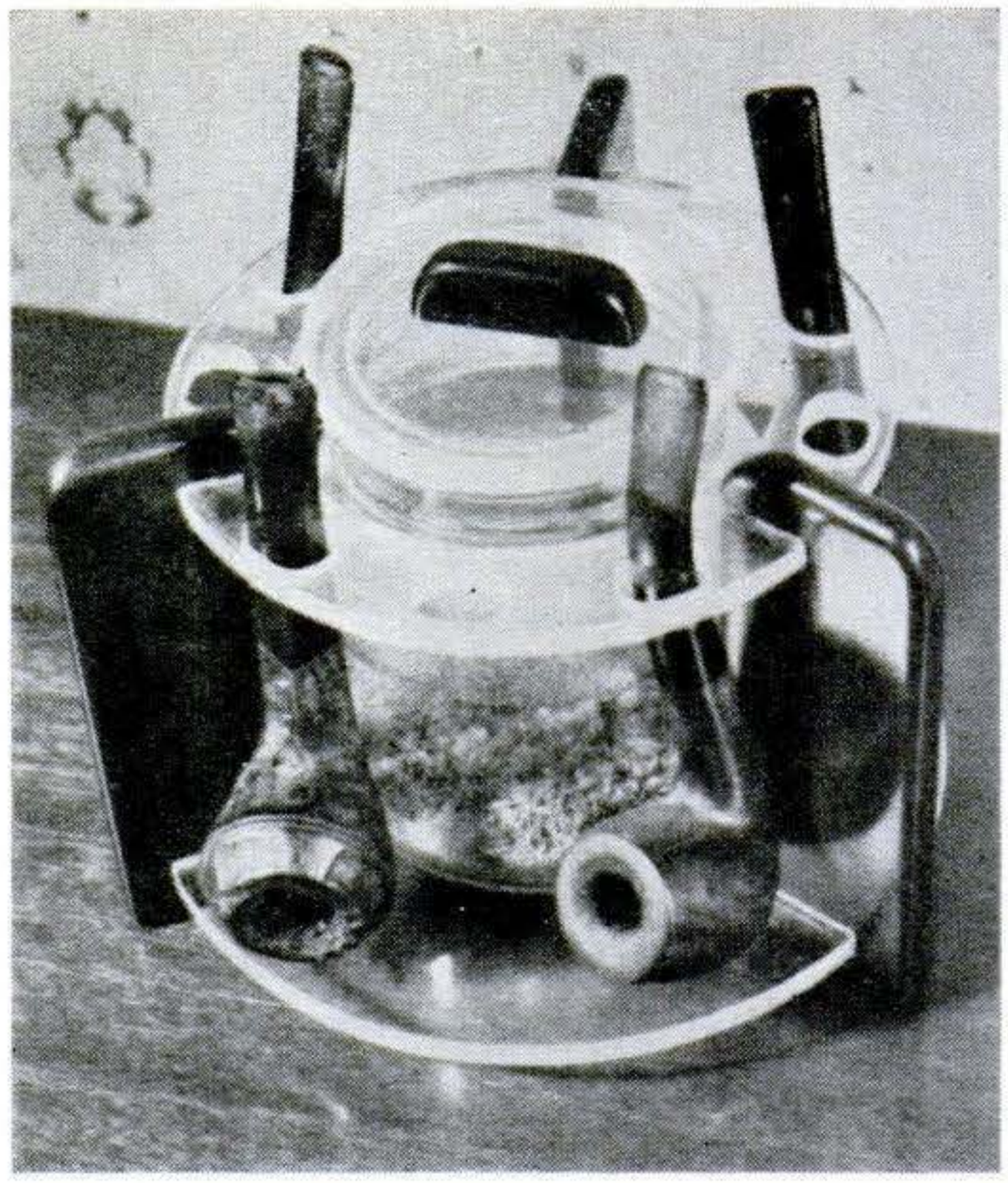
Arms for the chair and sofa are 4" logs split down the middle. It's best to cut, peel, and rip these while they're still green, for small cracks often mar material of this size that's cut when dry. END

Copyrighted material



Copyrighted material





Pipe Rack Contrasts Ebony and Plastic

CLEAR plastic and polished ebony are pleasingly combined in this pipe rack and humidor, but it might also be made of colored plastic and wood, plastic alone, or all wood. In this case, the humidor is a jar that originally contained shortening.

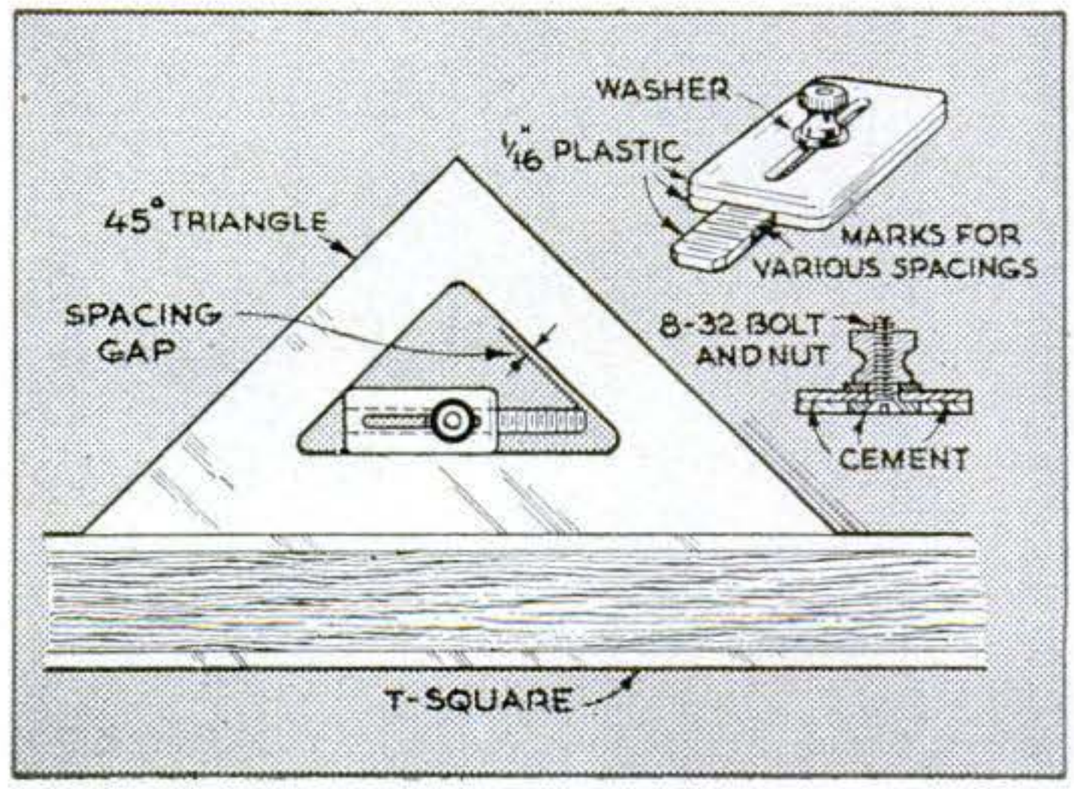
The humidor jar rests on a 7″ disk of ¼″ plastic and is retained at the top by a 6″ plastic ring that has a 4″ hole. Interlocking notches join these plastic parts to three wood uprights 120 deg. apart. The notches in the uprights are ½″ deep; another ½″ is recessed both sides to enter the notch in the plastic. A 2¾″ disk cemented under the lid serves as a retaining flange. The handle is another piece of ebony.

After sawing the plastic parts, smooth the edges with a file and sandpaper, ending with No. 400 Wet-or-dry Ⓣ paper, used with water. Then buff to a high gloss. If you like, you can file and sand the pipe holes to elliptical shape to conform to the pipe stems. Fasten the parts together with cellulose cement. If the finish applied to the wood parts contains oil, be careful to keep it out of the joints, for this would prevent the cement from holding. Round the edges of the wood parts and finish in any conventional manner.—*E. D. Groves, Winfield, Kan.*

Adjustable Guide Produces Equally Spaced Lines

DRAFTSMEN will find this little adjustable device helpful in drawing crosshatching or lines of any desired spacing. It may be used for horizontal and vertical lines as well as for the 45-deg. lines shown.

A line having been drawn, the guide is held stationary while you slide the triangle left until it's stopped by the tongue of the guide. After drawing a line, you hold the triangle stationary and move the guide to the left. Then the triangle is again shifted and another line drawn.—*A. D. Guagliardo, Milwaukee, Wis.*



Copyrighted material

Intricate scrollwork makes this candy dish a challenging project for the jigsaw enthusiast.

Jigsaw the pattern with the plate face down on the table.

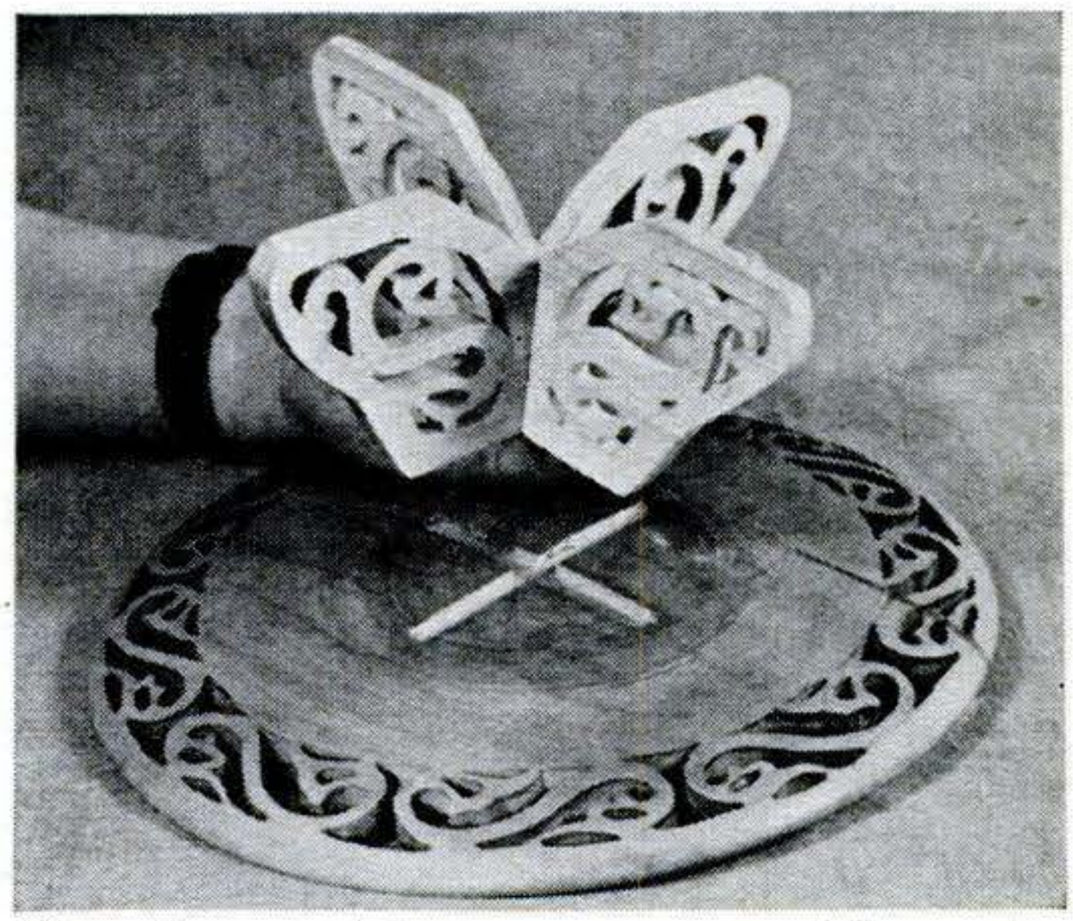
Lace Design Cut in Candy Plate

ALTHOUGH this lacy-edged candy plate might be made of almost any kind of hardwood, gumwood for the plate and holly for the stand present a nice contrast in color and grain.

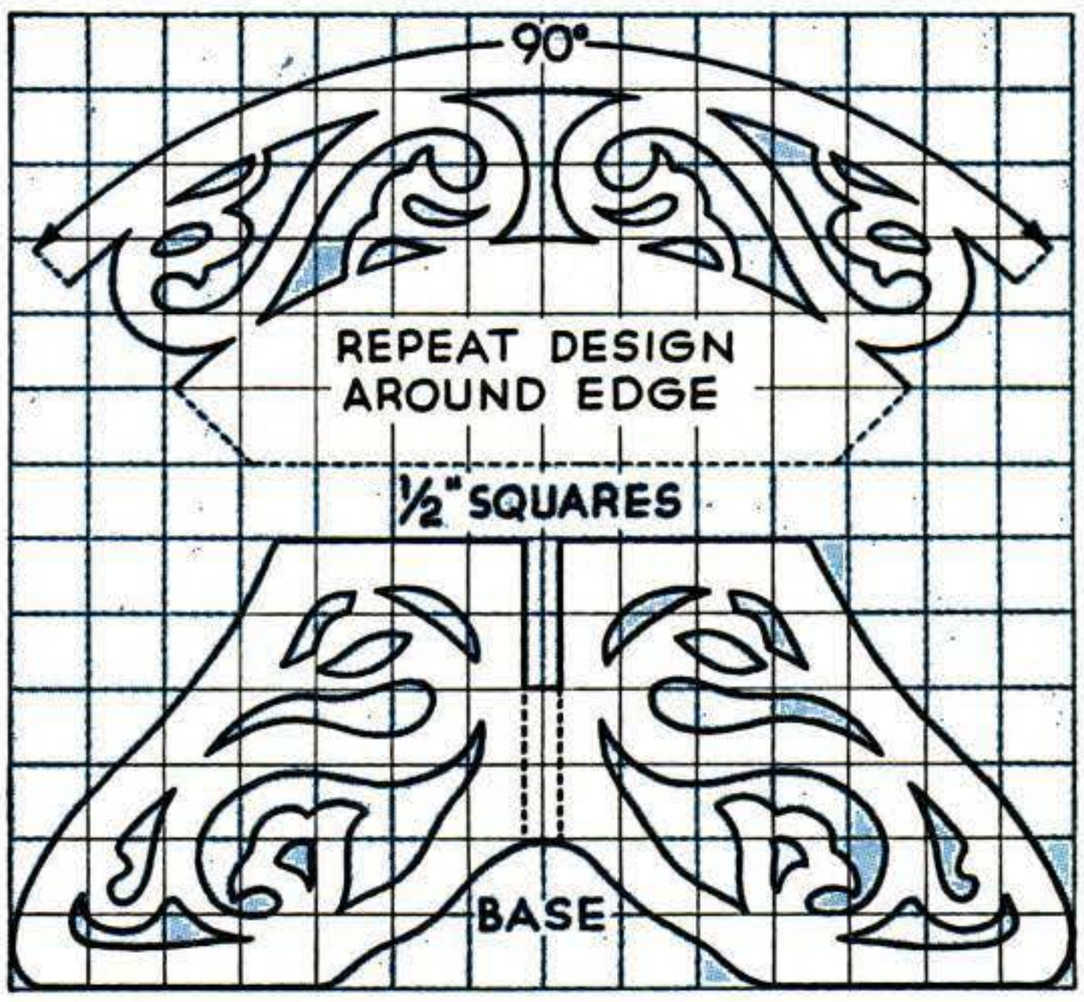
After cutting a 10″ disk from stock about 1½″ thick, rout out grooves ⅛″ deep, ¼″ wide, and 3½″ long, crossing at right angles at the center of one side. These take the two parts of the stand.

Tack a faceplate of scrap wood over the grooves and turn the disk to plate shape, thinning as much as desired and making the completed job 9½″ diameter. Lay out the edge design on tough manila paper and transfer to the underside of the plate. Since this is a reverse repeat design, your pattern will need to include only the 90-deg. section in the accompanying drawing.

Although the cutting job is easiest with a power saw, it could be done with a coping saw if you work carefully. In laying out the two parts of the stand, note that the notch is in the upper half in one, and at the bottom in the other. Slip one into the other like the separators in an egg carton. Glue the parts together after sanding, shellacking, and waxing.—*E. Waltner, Hurley, S. D.*

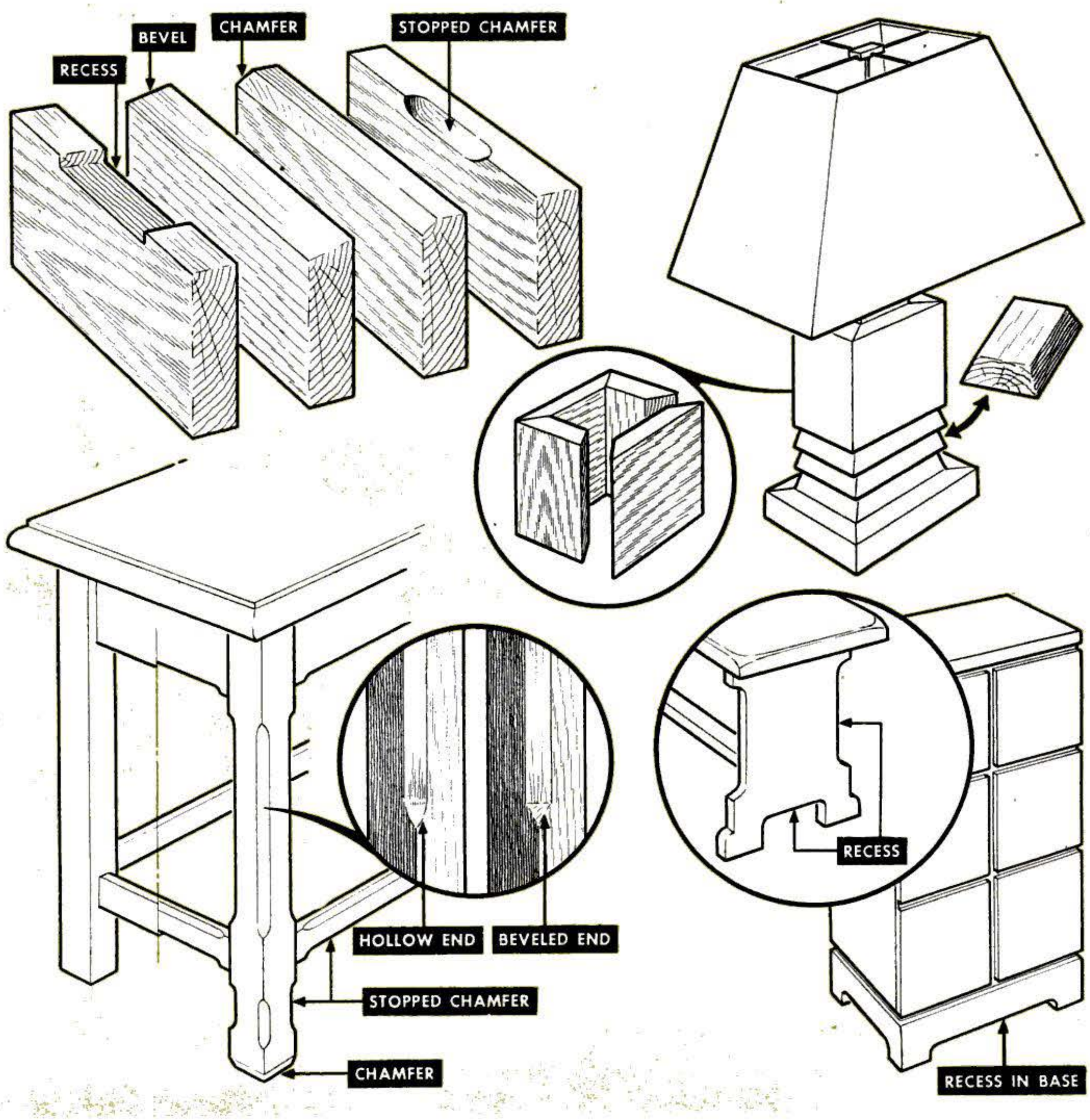


Glue the stand in grooves cut at right angles in the plate. Shellac and wax the finished job.



Draw the patterns on paper and then trace. For the plate, you need just the part given above.

Copyrighted material



Beveling and Chamfering by Hand

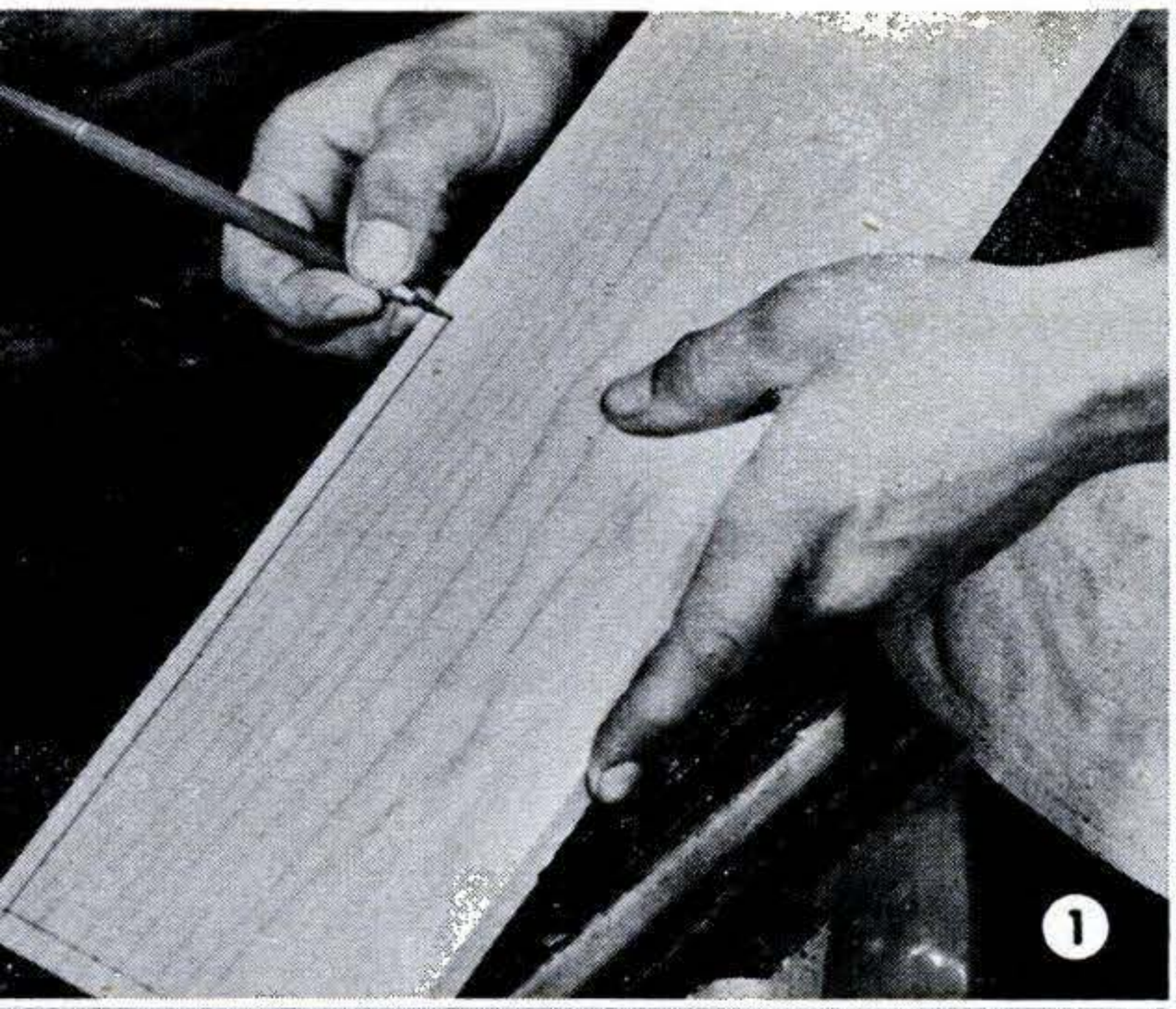
These simple hand-tool operations will make almost any exterior edge more decorative and eye-appealing.

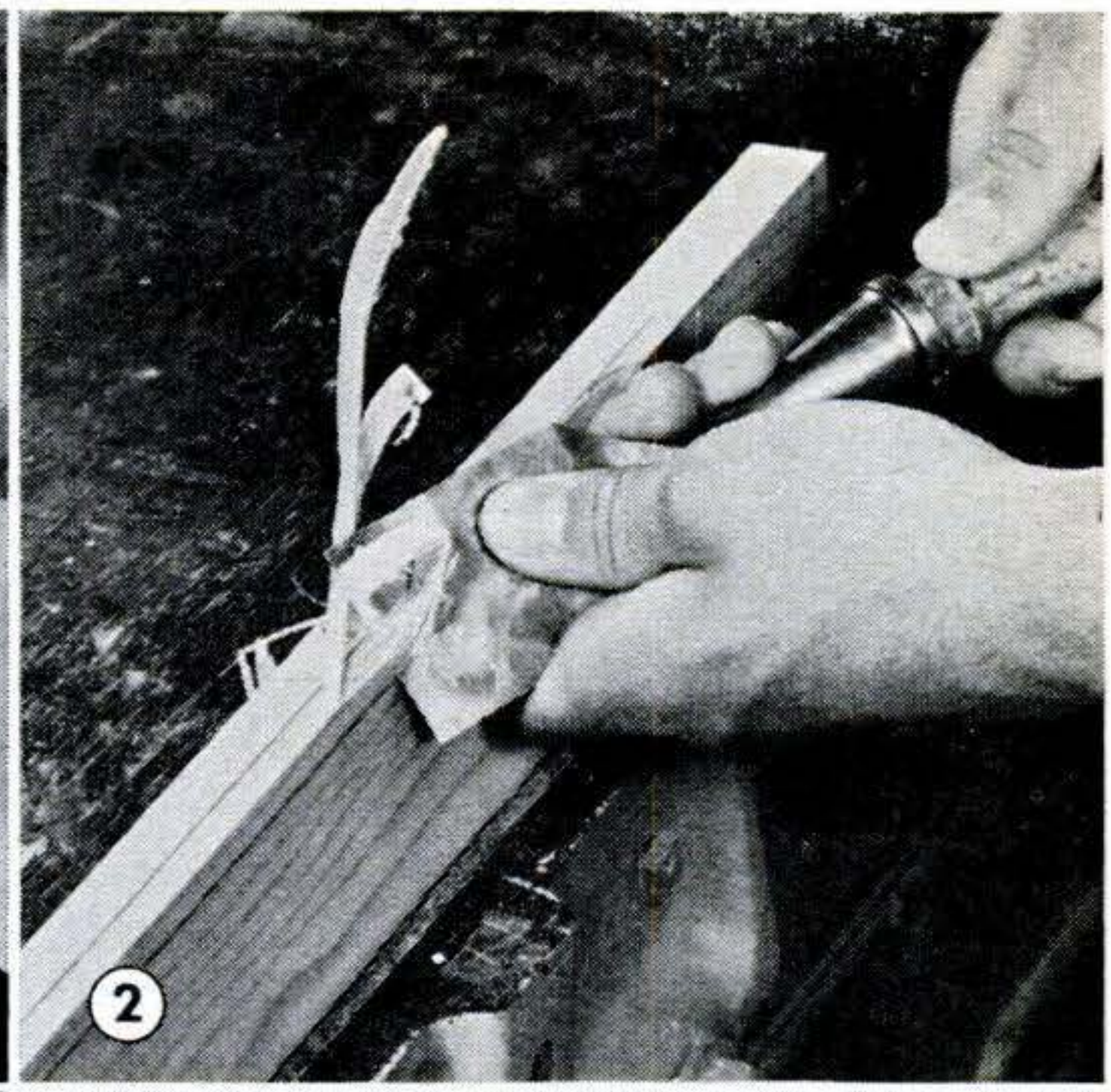
By Edwin M. Love

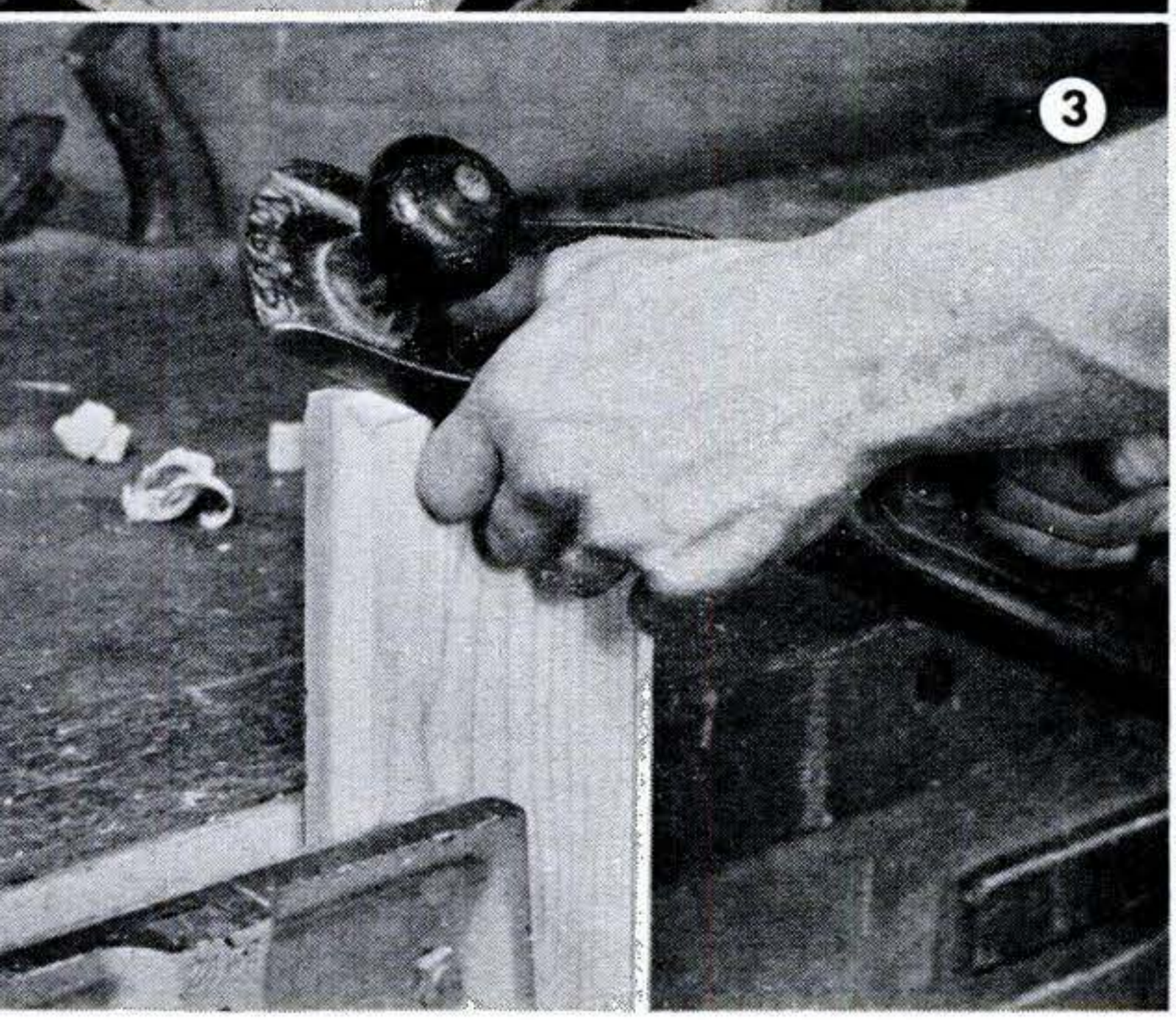
THERE are countless uses for boards with squared edges and ends. They fit in nicely as shelves or partitions, and as sides and tops of simple pieces of furniture. But sooner or later you will want to enliven plain lines with the touch of ornament and variety that you can get with chamfers, bevels, and recesses.

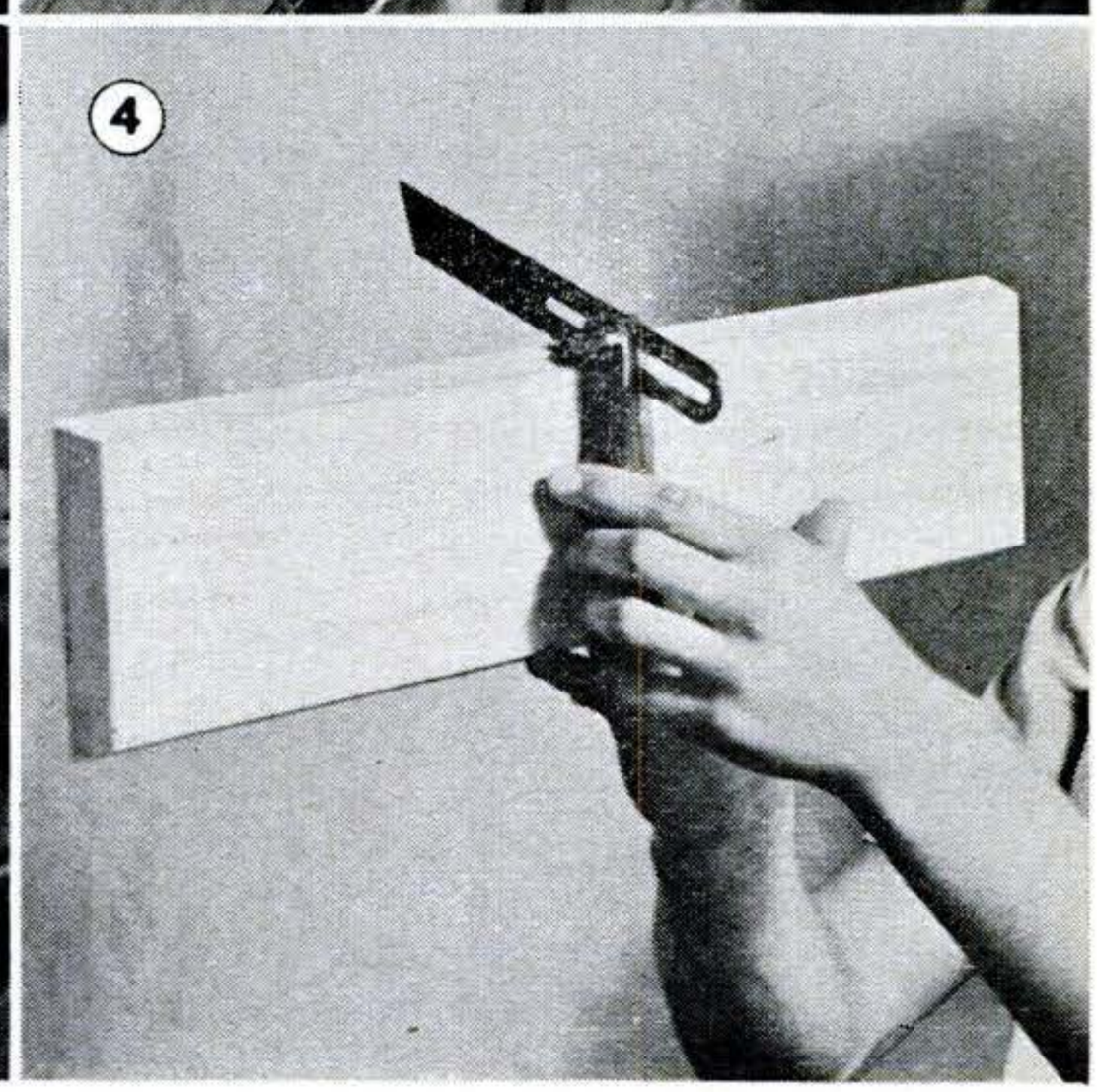
A chamfer is made by trimming off an arris, usually at a 45-deg. angle. Besides being ornamental it is utilitarian since it blunts the sharp angle and reduces wear. Stretchers of refectory tables where monastery monks parked their feet to keep them off the drafty floors were often chamfered. In grandfather's day chamfers on square

Copyrighted material







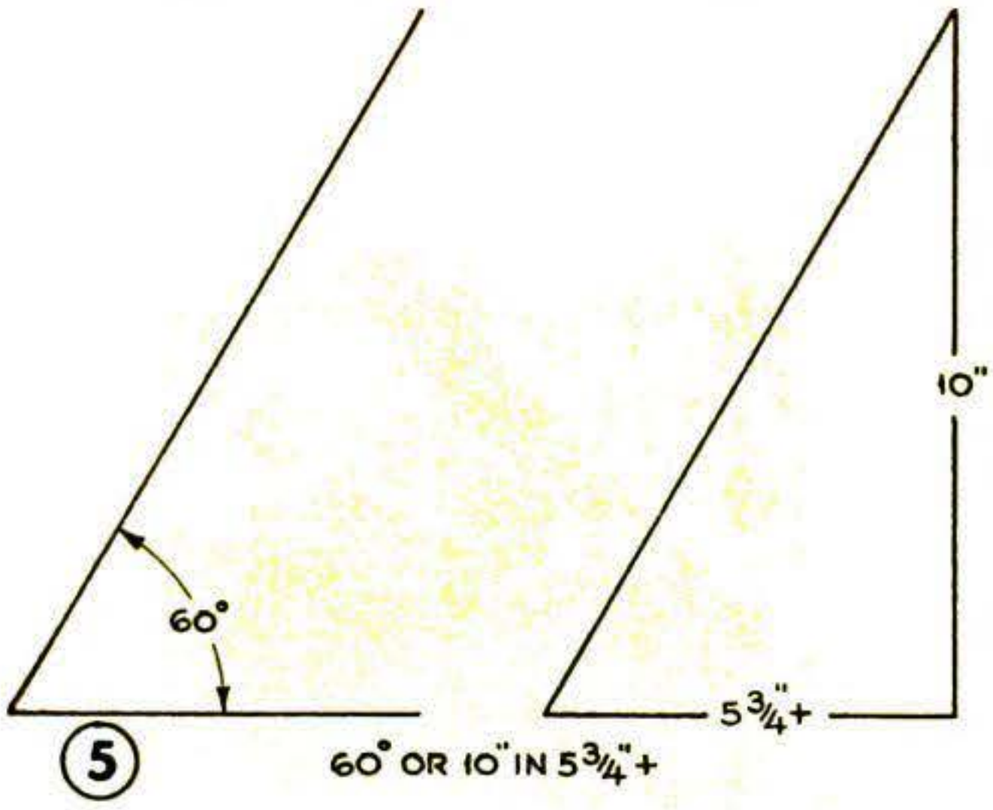


porch columns forestalled dents from busy rocking chairs. Some of the uses of chamfers in furniture are illustrated in the drawing at the top of the facing page.

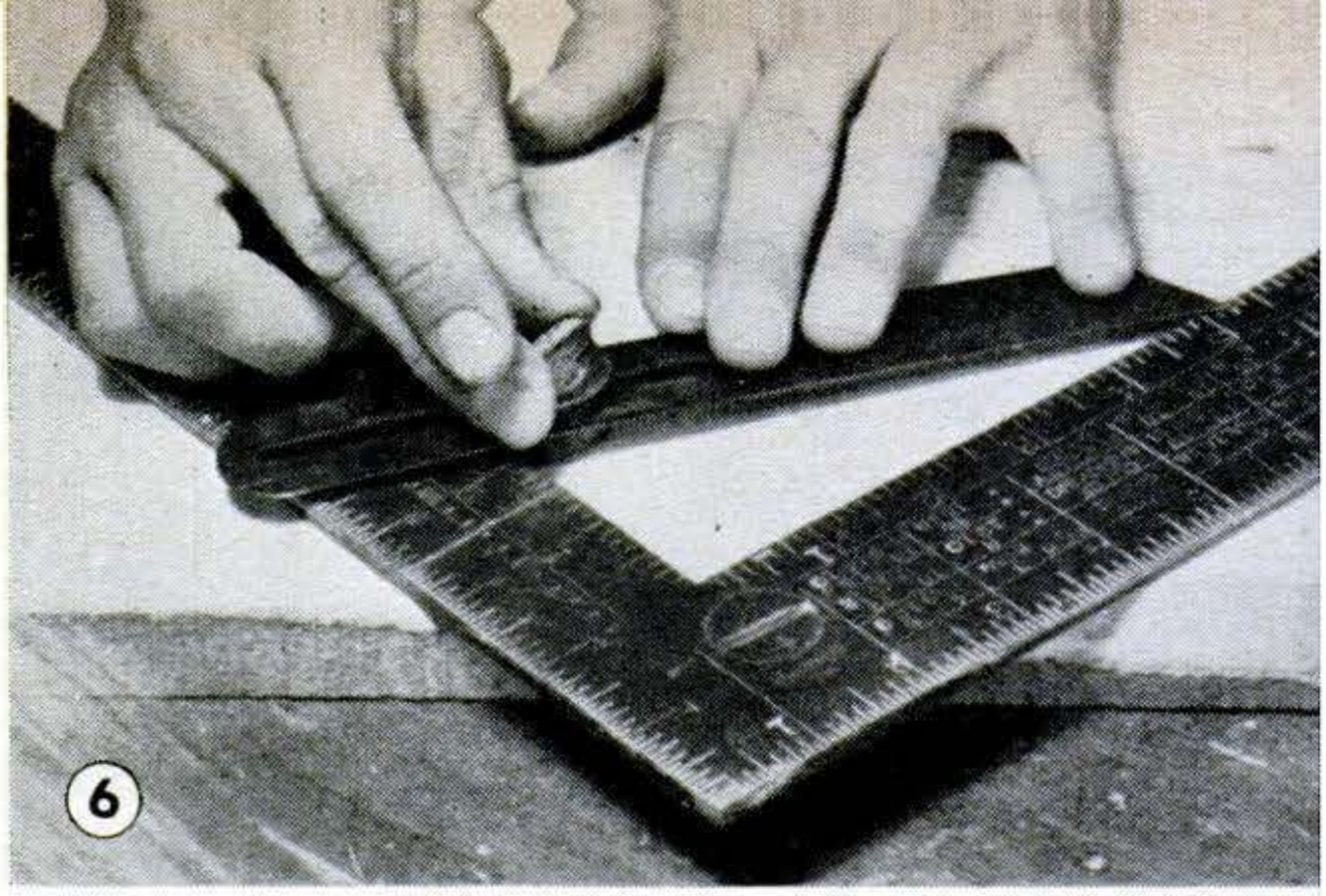
The guide lines needed for chamfering are drawn with pencil as in Fig. 1, or by using a combination square in place of the fingers. Don't use a marking gauge, for the scratches it makes will remain to mar the work. Trim off the arris with a sharp chisel. Rough out the chips with the bevel side down (Fig. 2), rocking the chisel edge up when it threatens to cut below the line. Work with the grain as far as possible. Final paring is done with the flat side of the chisel down. Smooth with a plane or cabinet file, according to the space or location of the piece. Placing your fingers between the sole of the plane and the work as in Fig. 3 will help you to steady the plane and establish the angle by feel. Cut a narrow chamfer entirely with the plane. The small amount of stock to be removed does not warrant a roughing cut with a chisel. A block plane used with a skew cut works especially well for chamfering the end of a board.

More interesting than the ordinary chamfer is the stopped chamfer, which does not extend the full length of the piece. Usually the stopped ends are hollowed or beveled, but sometimes—if the chamfer is made for a joint—the ends are cut square in. A plane cannot be used on a short stopped chamfer, so the bottom has to be finished with a chisel or, if the wood is cross-grained, with a cabinet file. Slide the file sideways on the stroke to cover the work evenly. Lifting it on the backward stroke saves wear and gives

Copyrighted material



5


6

better control. The file used for finishing should be well taken care of. Do not use it on metal, and don't toss it into a drawer with other files.

A hard block backing should be used when sandpapering chamfers. Guide the paper and block like a plane and avoid rocking.

Check the angle of the chamfer with a sliding tee bevel—more often called a bevel square—using it like a try square, as in Fig. 4. On woodworking plans the angle of a chamfer is either given in degrees, or the amount of rise of one leg is measured from a base of given length (Fig. 5). In the first method the bevel square is set by a protractor. In the second, a framing square is used as shown in Fig. 6.

Bevels

A bevel is a chamfer so wide that it includes the entire edge of a board. Among its uses are ornamental sloping bands in modern designs, and miters for column joints, both employed in the lamp design shown at the top of page 178. To change a squared edge to a bevel, mark the angle on the end of the piece and gauge a guide line for the lower arris. Marking and gauging are the same as for chamfers.

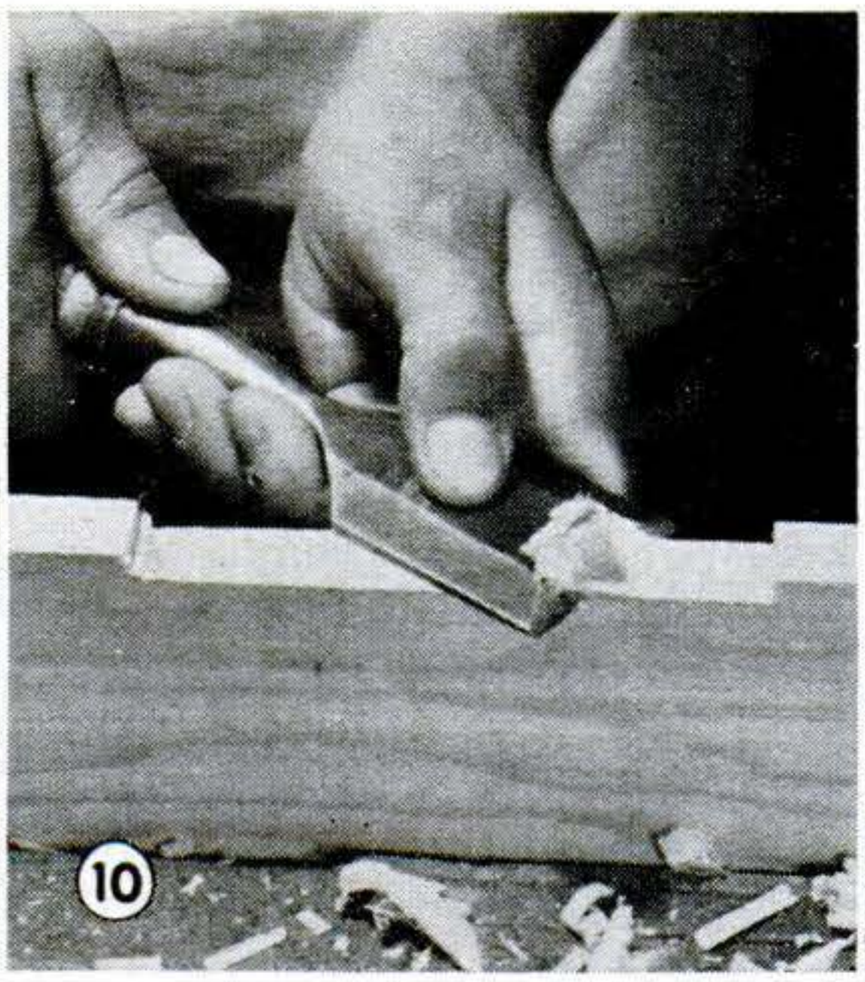
Plane the angle if it is only a few degrees off square. Use a drawknife or a chisel if it is greater and considerable stock must be removed. Finish with a plane (Fig. 7).

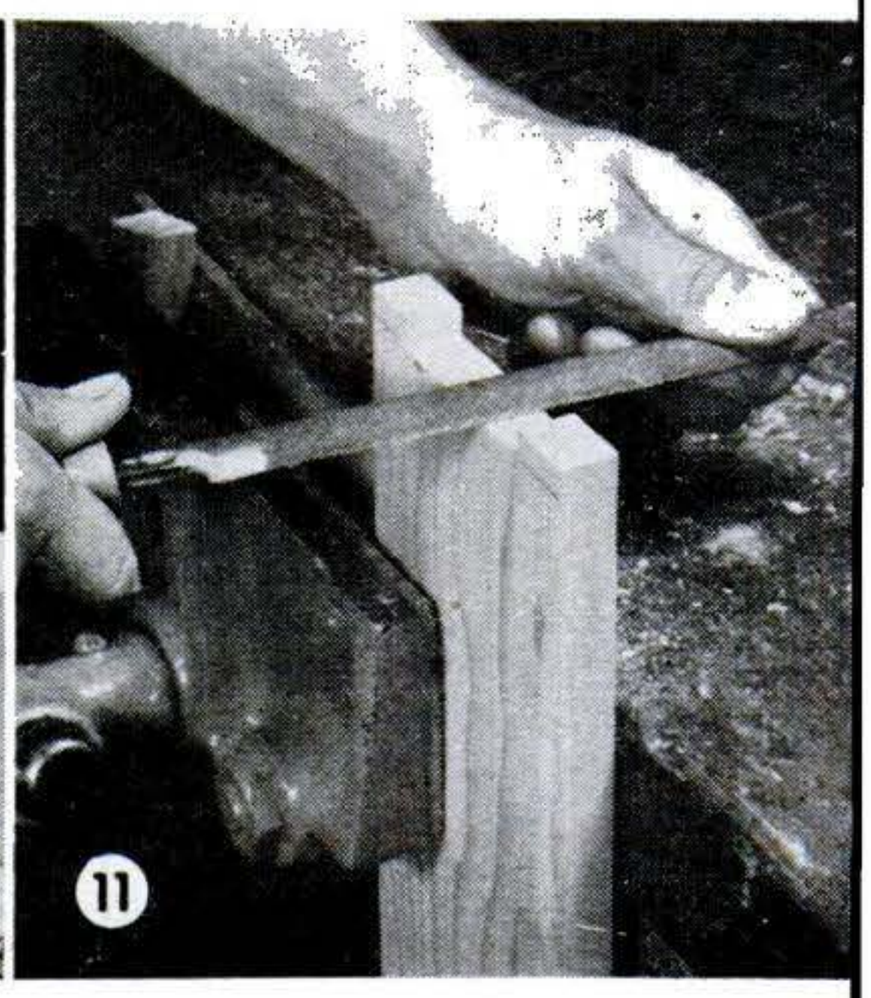
Sawing a bevel is often preferable to chiseling. Gauge a guide line, or—if the edge of the board is rough—draw it with a straightedge. Mark the angle on the end of the piece, incline the saw blade to left or right according to the angle, and rip to the line. A block cut to the proper angle and held against the blade and the board helps to maintain accuracy.

Ripping is especially useful when a number of beveled strips must be made from one board, since one bevel cut makes two beveled edges. The overlapping of the edges also saves material. Usually very little planing is needed to smooth a ripped bevel.

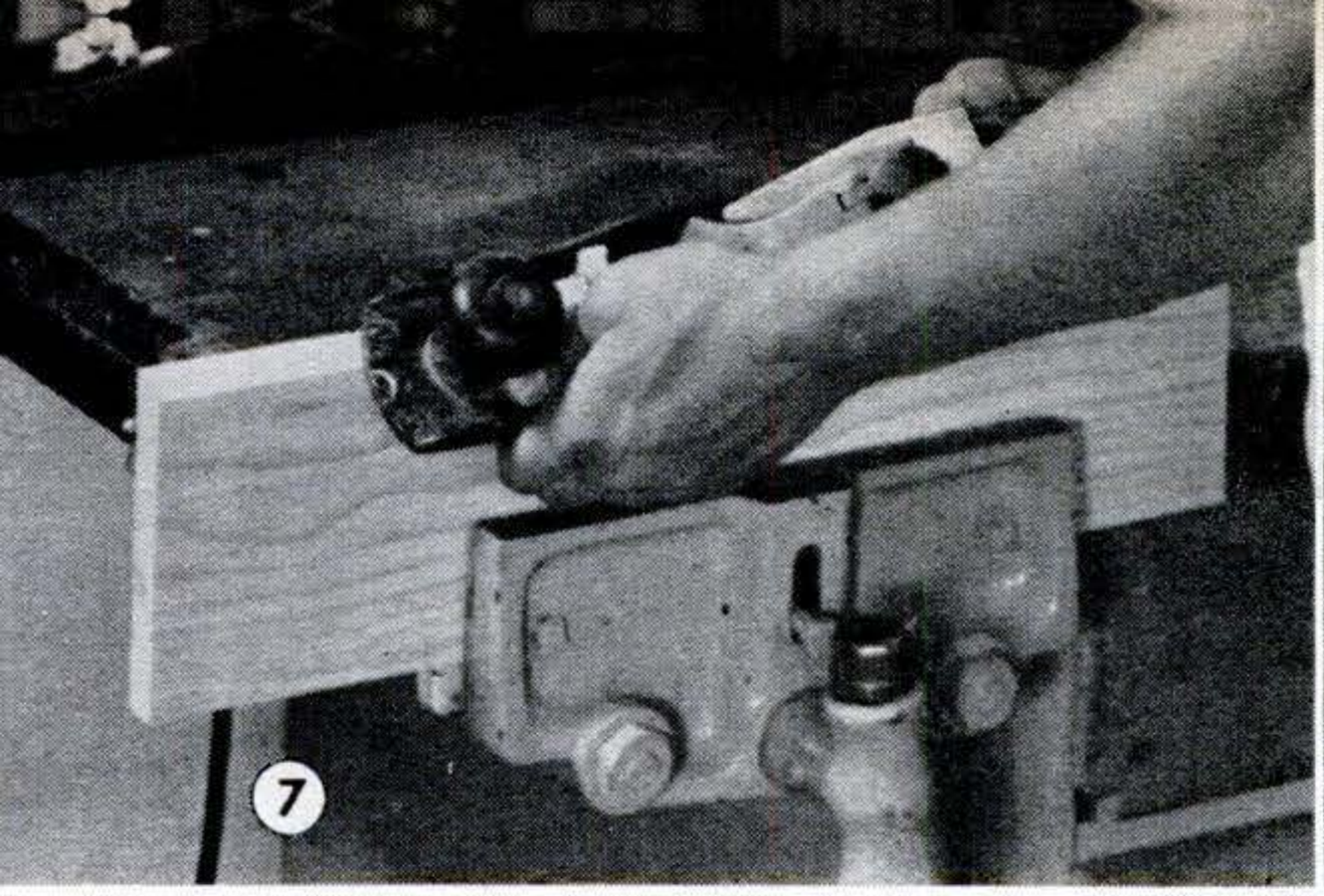
The sharp edge of a wide bevel is fragile and therefore offers a poor base for gauging

9


10


11

Copyrighted material



7

8

the width of the piece. For this reason, when marking a beveled piece to width, it is best to measure the width and draw the line along a straightedge.

Generally an end bevel should be sawed, although paring with a chisel is often convenient with thin stock. Planing follows the rules for end chamfering. Splintering of the back can be avoided by clamping a waste piece against it before planing.

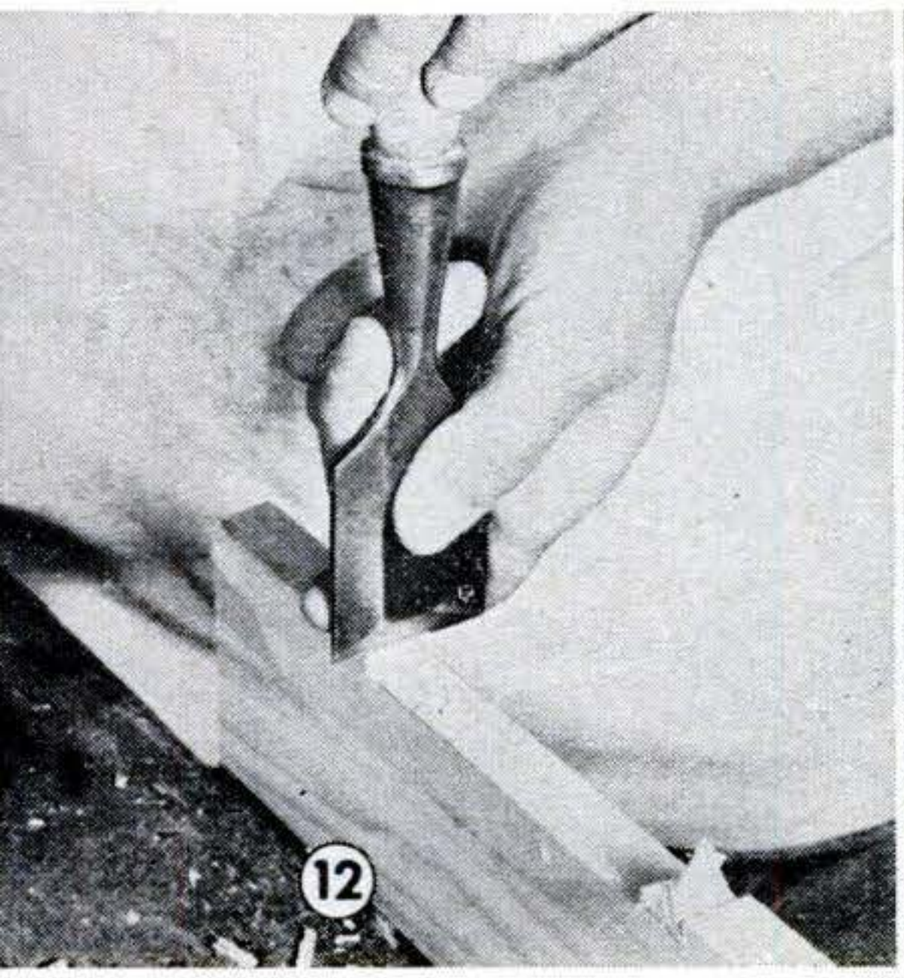
Recesses

The lower right-hand units in the panel on page 178 illustrate some decorative uses of recesses in furniture design. In power-tool jigs and other gadgets made in your shop such notching is a means of detouring two pieces around each other.

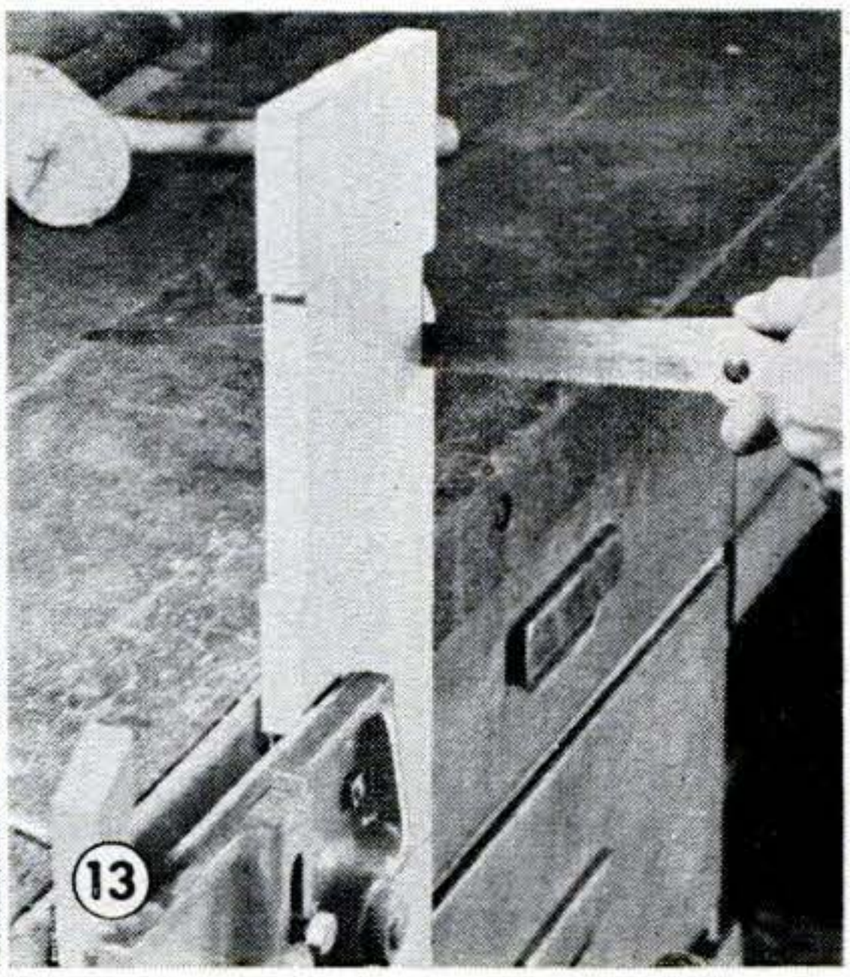
A guide line need only be drawn on the face for many recessing jobs, but when working with thick stock a line on the back is a real help. Cross-score the edge with a chisel, as in Fig. 8, beginning about 1/16″ from an end to avoid crushing the corner. Lean the chisel toward the bevel for easy shearing cuts. This breaks up the waste strip and prevents it from splitting into the board below the line. The sequence of rough and paring cuts, illustrated in Figs. 9 and 10, is the same as that described above for chamfering. Smooth the bottom of a recess with a plane or cabinet file (Fig. 11), and trim the end by chiseling straight down as shown in Fig. 12.

Recessing an end is a bit more difficult. There is no problem of splitting into the work, so cross-scoring is unnecessary. But a chisel driven by heavy mallet blows may tear pits in the end grain. Lay the piece on the bench with a protecting block beneath it, and chisel from both sides. Clamp the work in the bench vise and pare along the line with the chisel bevel up. Swing the blade sidewise for a shearing cut.

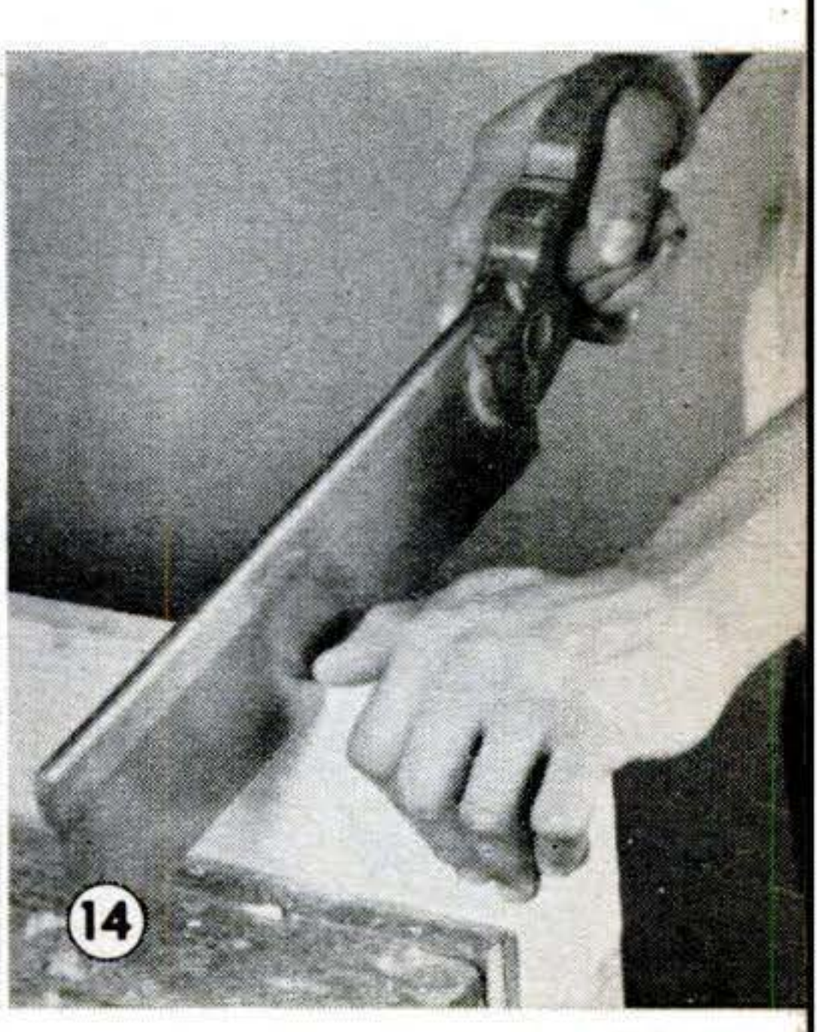
When the recess is long enough to make it worth while, cut it with a saw. Chisel an end to depth or bore a hole; then start the cut with a compass saw as in Fig. 13. Finish with a hand saw if there is room. A back saw is convenient for cutting the ends (Fig. 14) but an ordinary saw will serve very well. END



12



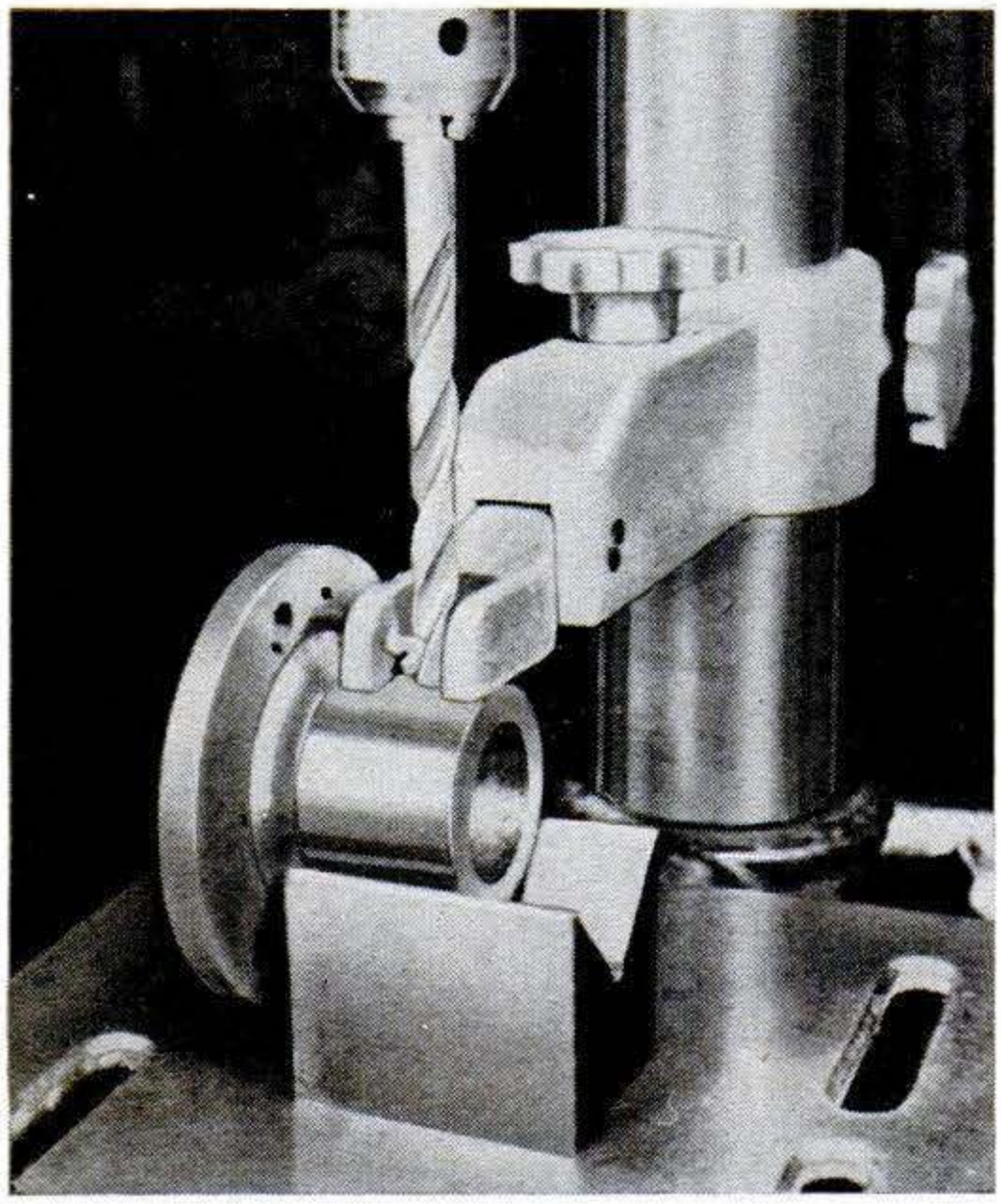
13



14

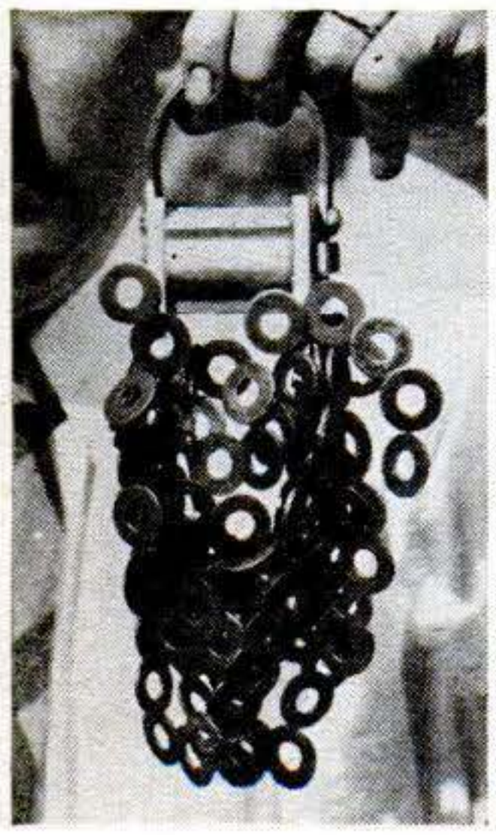
Copyrighted material

NEW TOOLS

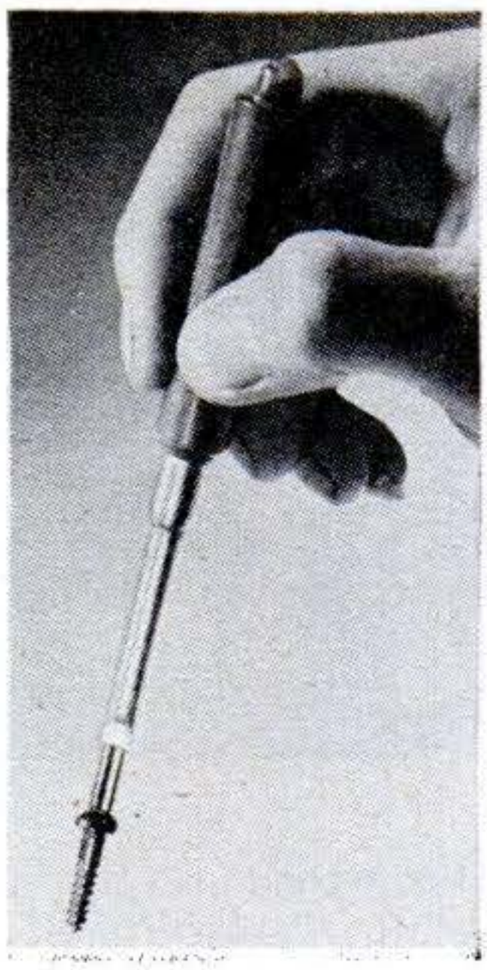


Work Clamped in Drill Press. This holder adjusts up and down on any round-column drill press to suit work of different dimensions. Adjustment also may be made by sliding the forked jaw in and out. As seen here, the holder is used with a V-block for drilling round work. Flat stock is simply clamped down against the table. The Pacific Coast Sales Agency, San Francisco, offers it for about $10.

Small Magnet Is Powerful. Although only slightly larger than a package of cigarettes, a permanent magnet produced by the Ronald Eyrich Co., of Milwaukee, Wis., has unusual holding power. As seen here, it will pick up a large number of small parts. It will also support a heavy coal shovel with only the sharp edge of the shovel touching the magnet. On a flat steel surface it has a pull of about 40 lb. before separation occurs. The retail cost of the magnet is about $2.

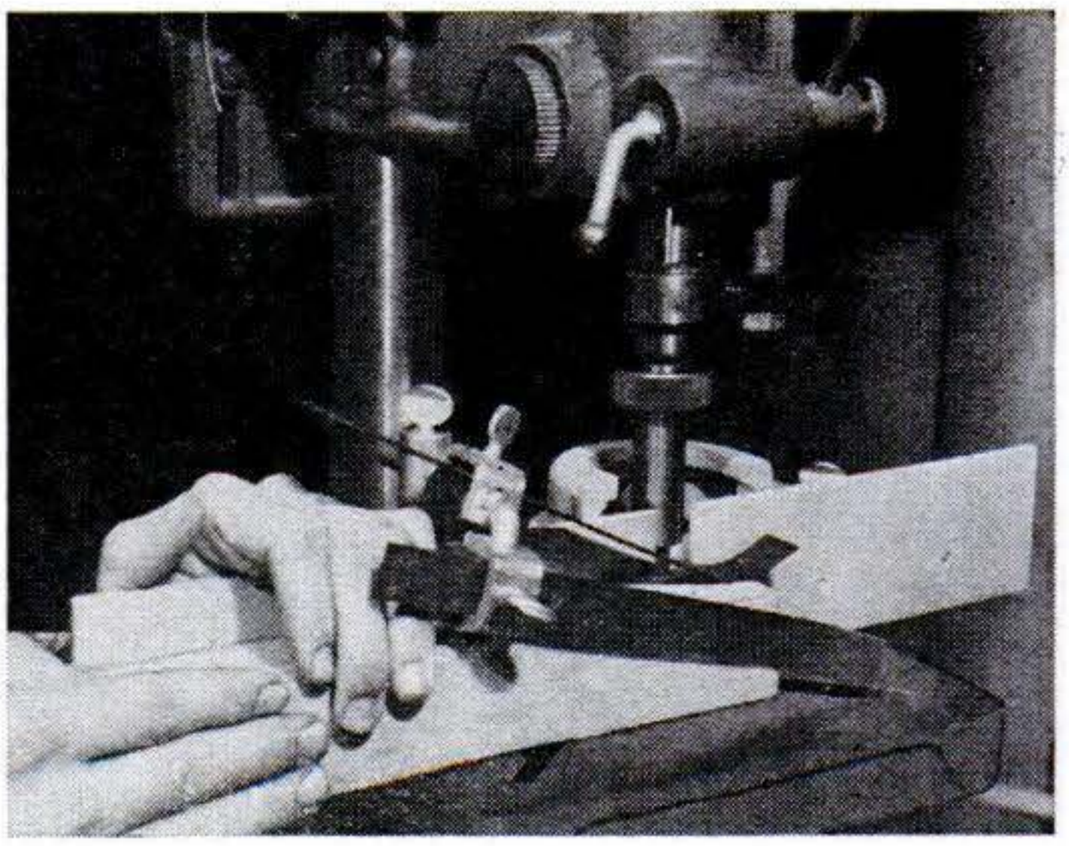


Screw Holder. A gadget for inserting screws in restricted spaces is produced by Screw Starter, Inc., of Denver, Colo. Pressing down on the handle causes the dual bits to twist in opposite directions, wedging them in the screw slot. Pushing a knob at the end of the handle frees the screw. The starter is made in several sizes.



Shaper Accessories. The Barron Tool Company, of Detroit, has introduced an all-metal fence and a new type of molding-cutter head, both of them for use with shapers and drill presses. Blades are retained in the cutter by ears that fit into slots in steel compression disks at the top and bottom. In addition to full-width blades, a split-blade design is offered. When employed in matched pairs, the half blades provide a number of standard shapes and molding contours. Used in different combinations, they give varied molding designs.

The fence plates are made of aluminum, and the right-hand one is adjustable by a vernier screw for infeed and outfeed. Twin hold-down springs with separate adjustment screws provide two-way tension on work of various sizes. The fence sells for about $8, the cutter for about $9.



Copyrighted material

Nonslip T-Square Rolls on Gears

RIDING up and down a 36″ by 48″ drawing board on rack-and-pinion controls, this precision T-square may be locked in any desired position. A ¼″ steel shaft rotating in pillow blocks keeps both ends at exactly the same height. The entire blade assembly can be lifted off the board when not in use.

Racks 3/16″ square fit in grooves 5/16″ from each edge of the board. The depth of these grooves will depend somewhat on the diameter of the pinion. When the shaft has been properly fitted in the pillow blocks, you can push the blade freely up and down the board. Close adjustment is made with the 2″ radio knobs at each end of the shaft. For still greater precision, a vernier action might be added to one knob.

The table top, made from ¾″ plywood, was grooved on the circular saw for the racks. A snug press fit holds them securely.

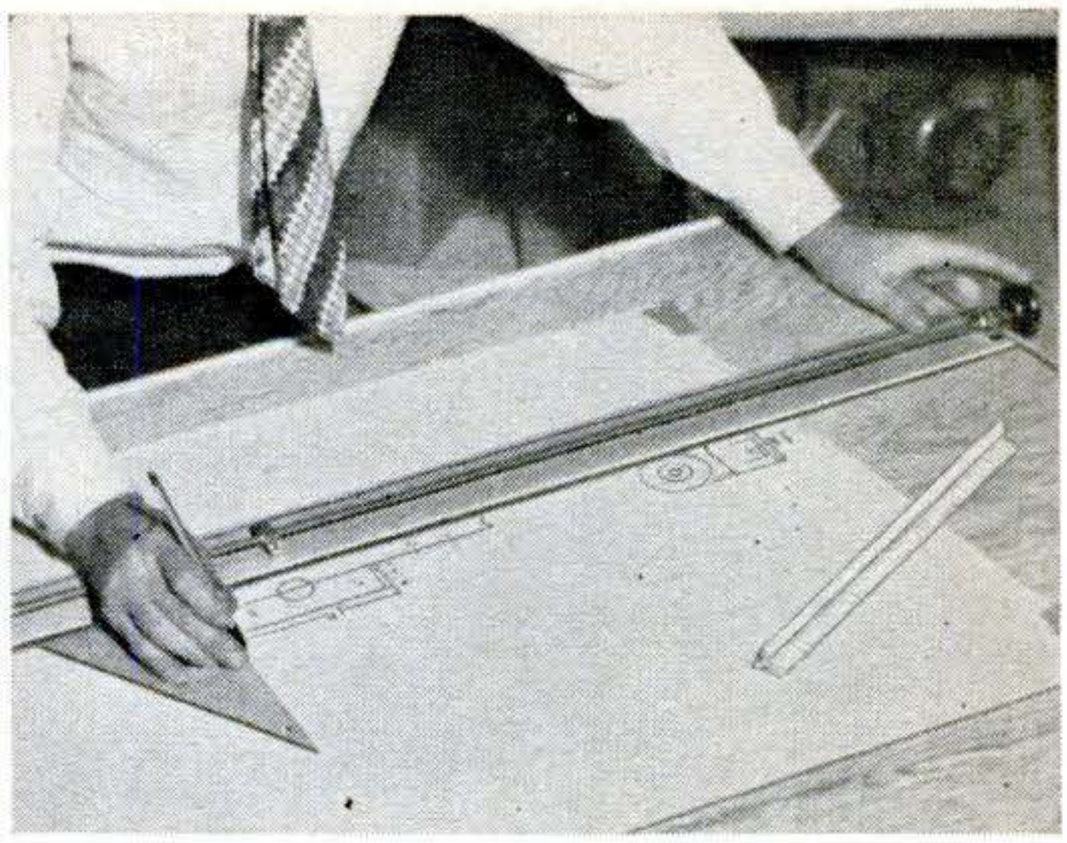
Taken from a T-square, the blade was cut to slide freely between the racks, and the pillow blocks were fastened to it with flathead machine screws countersunk in the lower face. Three pillow blocks are required to keep the long shaft from flexing.

Thumbscrew Locks Blade

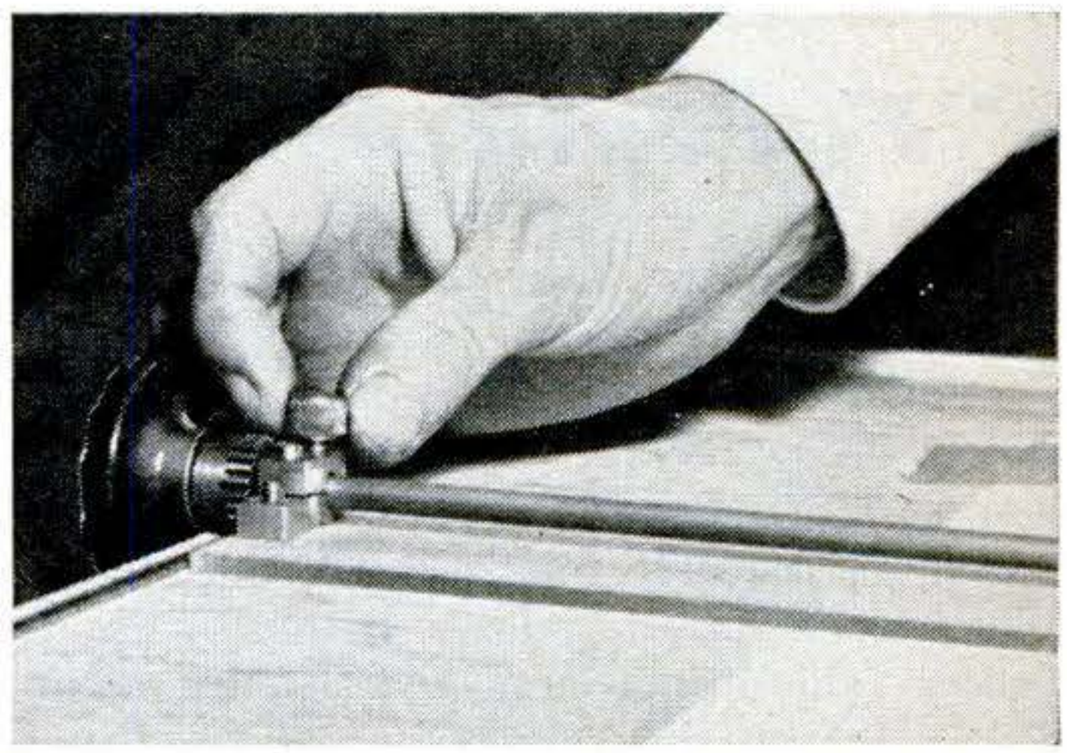
So that the shaft may be locked to keep the blade in any desired position, the upper part of one pillow block was removed and its lower face ground down. One of the pillow-block screws was next inserted to the point where the shaft wouldn't turn, then backed off slightly, and locked with a set screw turned up from underneath. With this adjustment made, tightening a shouldered thumbscrew in the other pillow-block hole prevents the shaft from turning.

When the job is complete, the pinions should ride on the racks without play, and there should be a paper-thickness clearance between the lower face of the blade and the table. This clearance may be varied by grinding off the bottoms of the pillow blocks or by shimming them up.

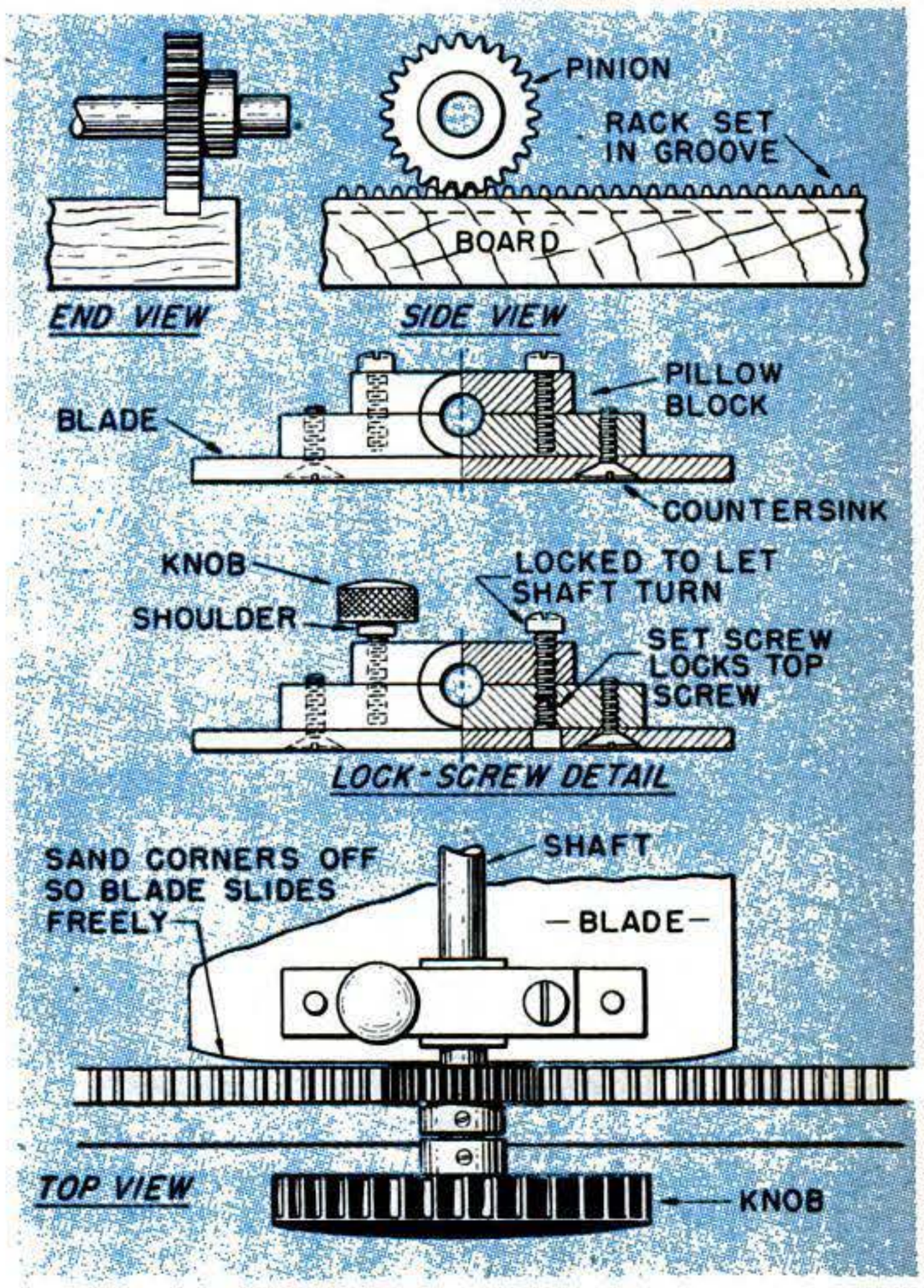
After the blade assembly has been lifted off, always replace it with the lower edge against the retaining strip at the bottom of the table.—*Charles T. Pearson, Chicago.*



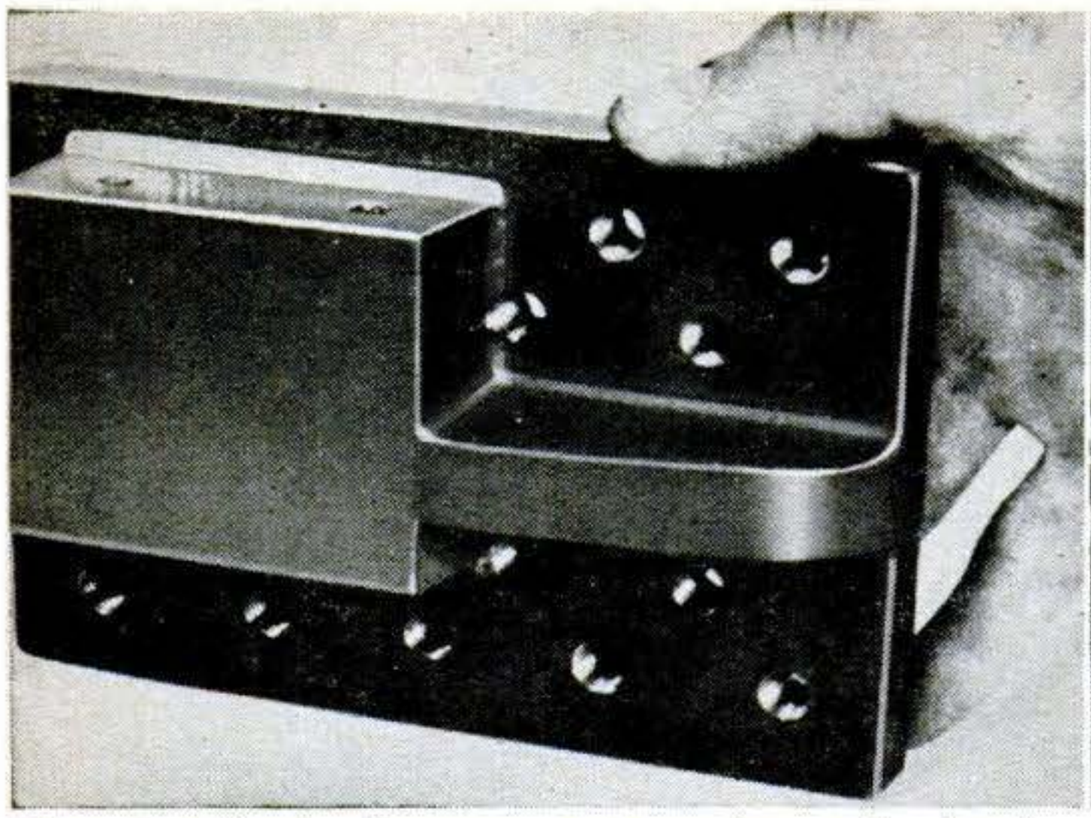
An easy push slides the blade up or down the board. Pillow blocks keep the ¼″ shaft rigid.



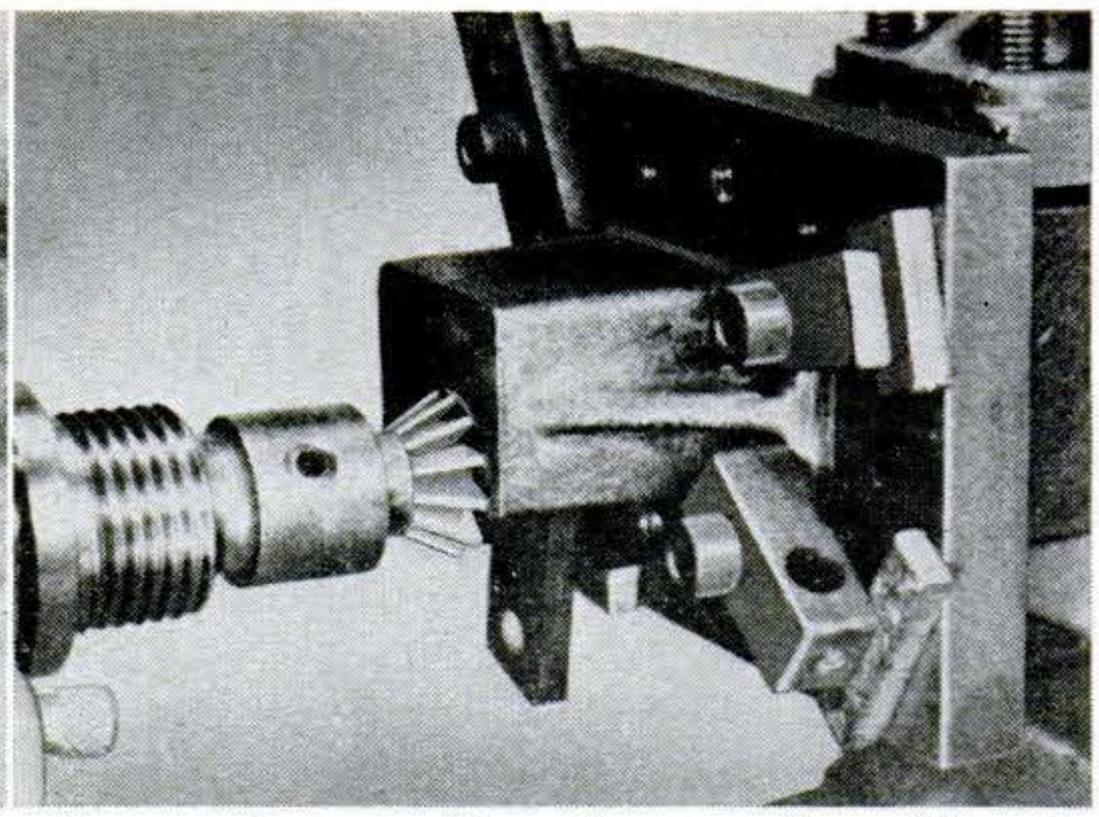
Tightening a screw in one pillow block locks the shaft, preventing the blade from slipping.



Copyrighted material



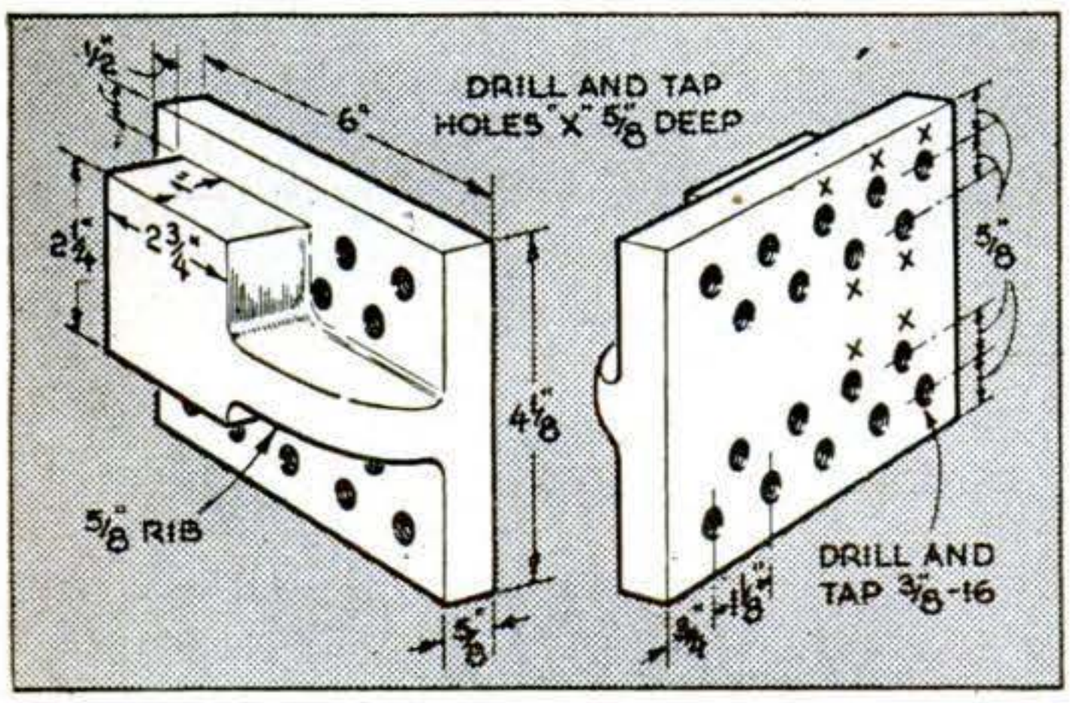
The finished adapter, as seen from the back. Note that the rib is centered on the plate but offset on the boss that fits in the vise.



Set up for use, the adapter will readily take a piece of work that would be very difficult to mount directly in the milling attachment.

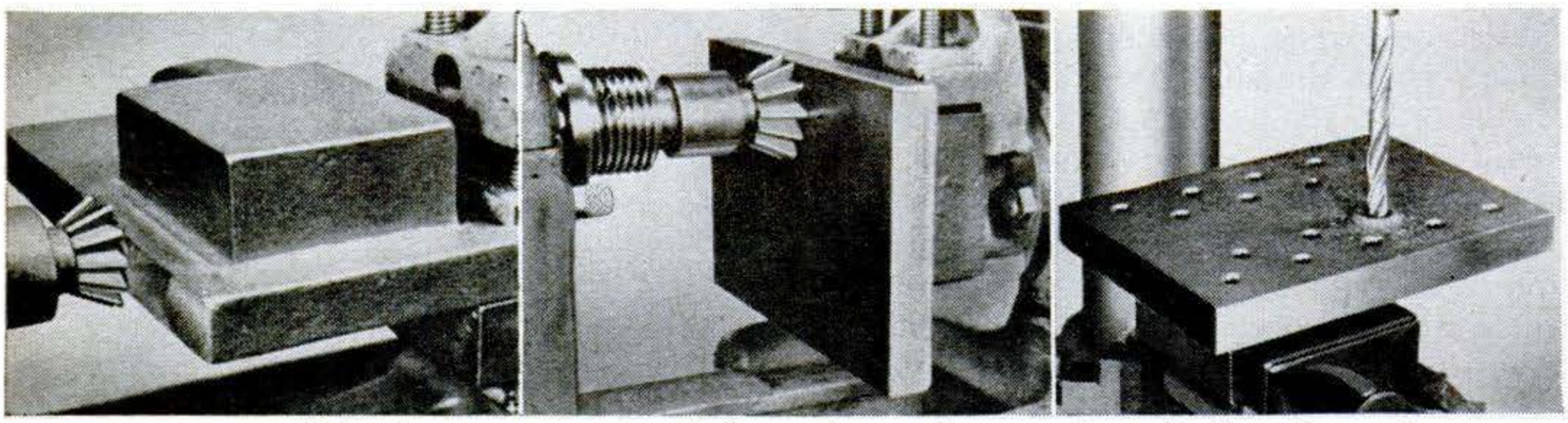
"Faceplate" Aids Milling in Lathe

YOUR lathe milling attachment becomes much more versatile with one of these "faceplate" adapters. A simple iron casting, it acts as a faceplate on which irregularly shaped workpieces may be mounted. It's useful for pieces too large to fit the attachment vise or too irregular to be held without tedious shimming. Because of its offset shape, it actually increases the length of work that can be milled at one setting.



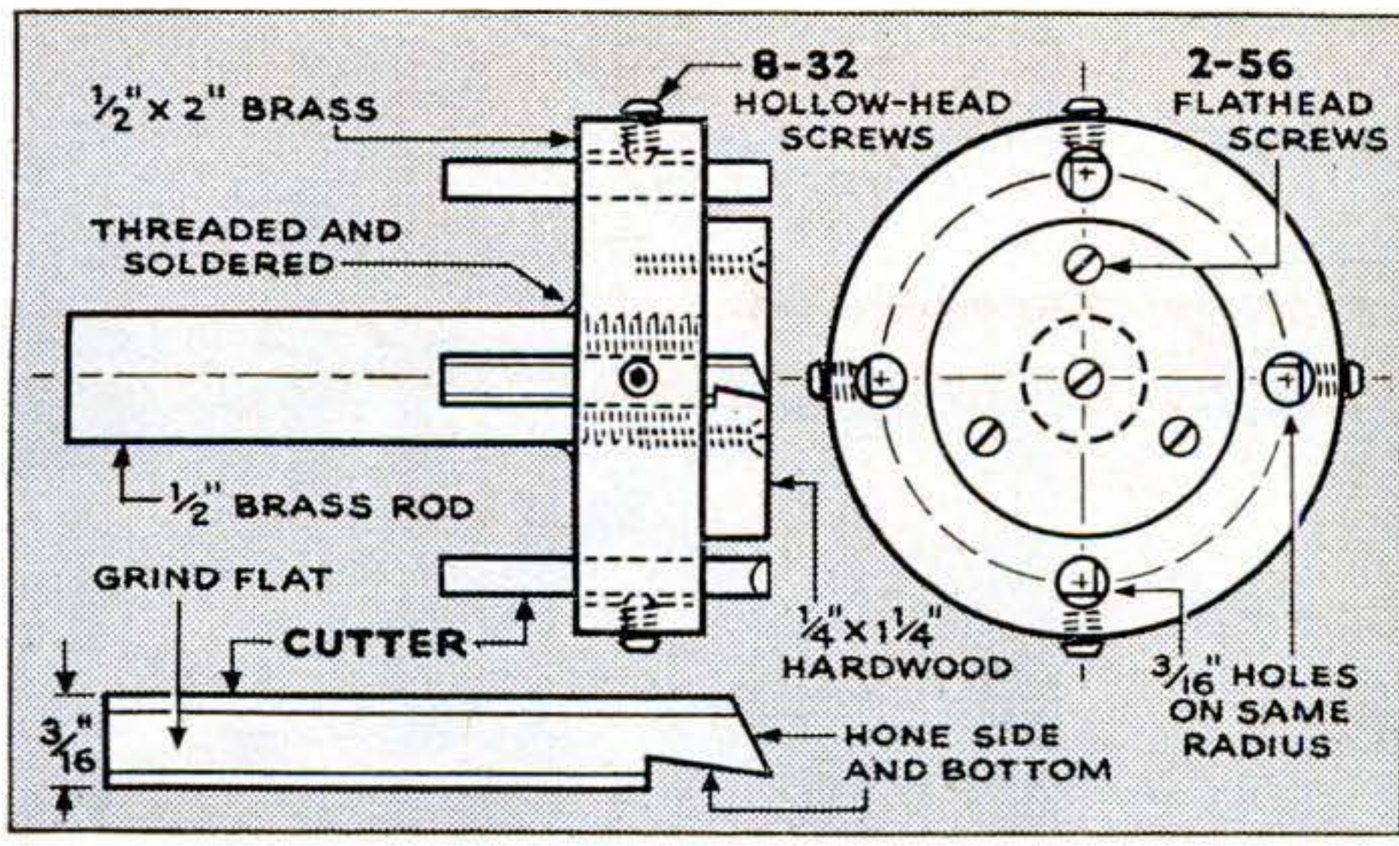
Make a pattern for the adapter, using any close-grained wood, sand it smooth, and add wax fillets. (The dimensions given are correct for the milling attachment of a common bench lathe, but can of course be modified to suit. In any case they should permit a small mill to sweep the entire surface of the plate.) Shellac the pattern and take it to a foundry.

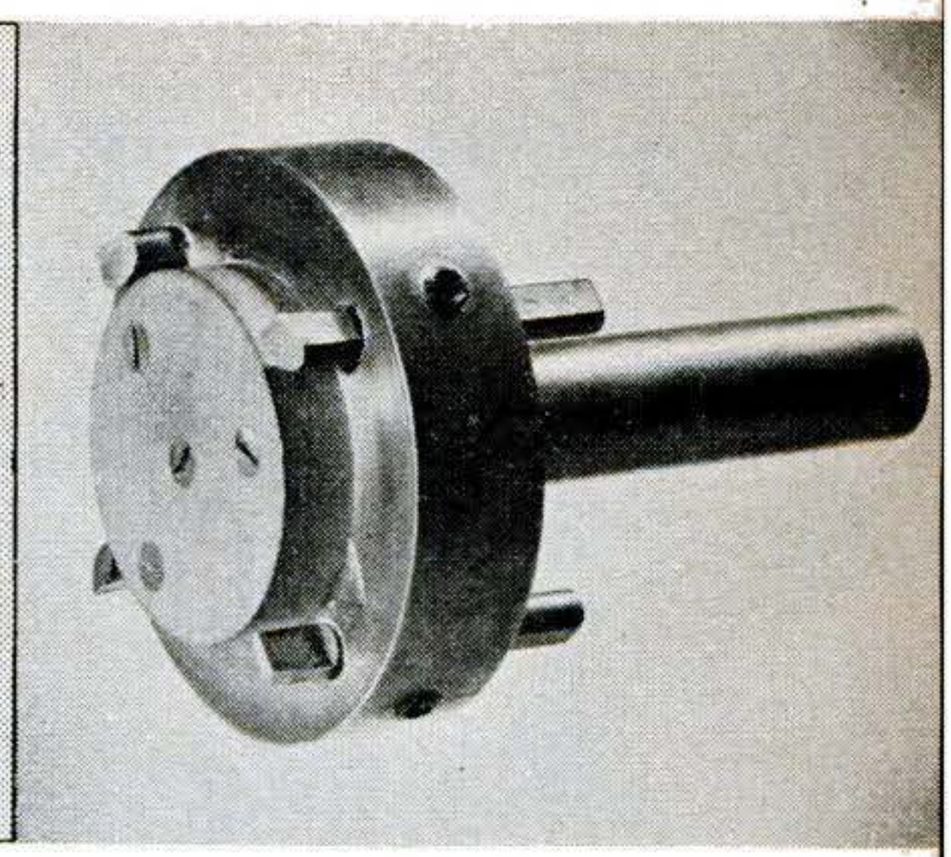
When you get the casting, square up the sides with light milling cuts. Then bolt the adapter to the attachment so you can mill the back of the clamp block; when finished this should set flush against the back of the milling vise. Clamp the casting in the vise as in use and, with the milling attachment set accurately at 0 deg., take a light finishing cut over the entire work face. Drill and tap for the hold-down bolts; the holes not marked with an X in the drawing are through ones.—*John A. Bates, Wise, Va.*



A skimming cut, left, dresses one side of the adapter when it comes from the foundry. Make the cut light because of the overhang. Center photo shows the finishing cut being given to the working surface. Drill and tap the mounting holes, right, in a drill press. Holes that are marked with an X in the drawing are blind, since they are opposite the vise boss.

Copyrighted material





Making Your Own Rotary Planer

SMOOTH, flat cuts are produced on wood with this rotary planer when it is spun at high speed in a drill press. It uses broken drill shanks as cutters. Building it is a fairly simple lathe job, though you'll want to take pains to get the tool true-running and balanced.

For the shank, use a 2½" length of ½" steel or brass round stock, and for the head a ½" by 2" steel or brass disk. Thread ½" of the shank with any convenient ½" right-hand thread, drill and tap the disk to match, screw them snugly together, and use a torch to run solder into the threads. Attach a hardwood pad to the disk with 2-56 screws, which should be countersunk slightly. Then chuck the tool in the lathe and take light cuts until all surfaces run dead true.

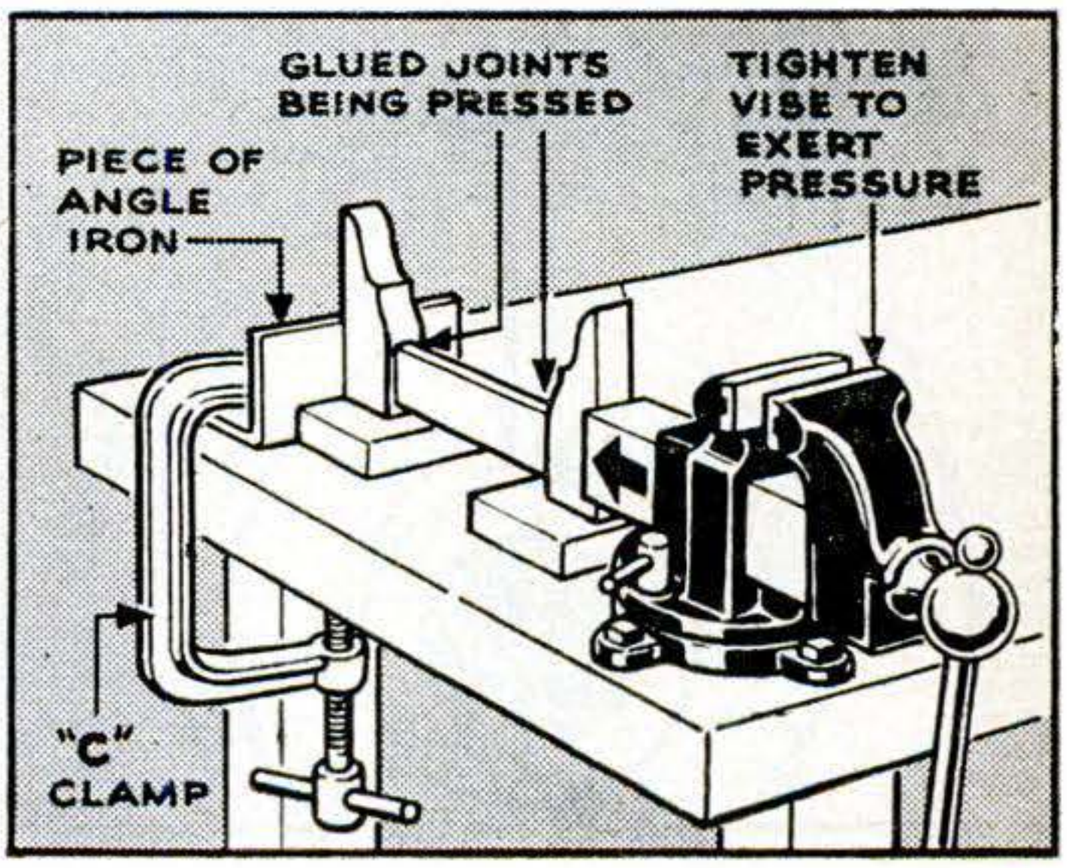
The cutter holes must be drilled on the same radius. I held the planer in a drill-press vise and clamped the vise on its side on the drill-press table, in position for the first hole. Then I merely loosened the vise jaws a trifle to turn the planer a quarter turn for each of the other three holes. Four radial holes should be drilled and tapped for the setscrews.

The shanks of broken 3/16" drills make excellent cutters, but if your scrap box doesn't have them, some 1¼" lengths of hardened drill rod will do nicely. Grind a lengthwise flat on each cutter, shape the front and bottom to provide a cutting edge, and hone to keenness on a fine stone. Set the cutters evenly (they should *not* extend beyond the hardwood pad) by resting the planer on a flat surface, pressing each cutter down individually, and locking it there. Do this each time the cutters are sharpened.

In use the tool will handle cuts up to ¼", and should be used at high speed with a fairly light feed. Keep your fingers well away from it. If successive passes produce a slight unevenness on the work, the table isn't square with the spindle. Readjust it until the tool produces a dead flat surface. —*Herbert R. Pfister, Bronx, N. Y.*

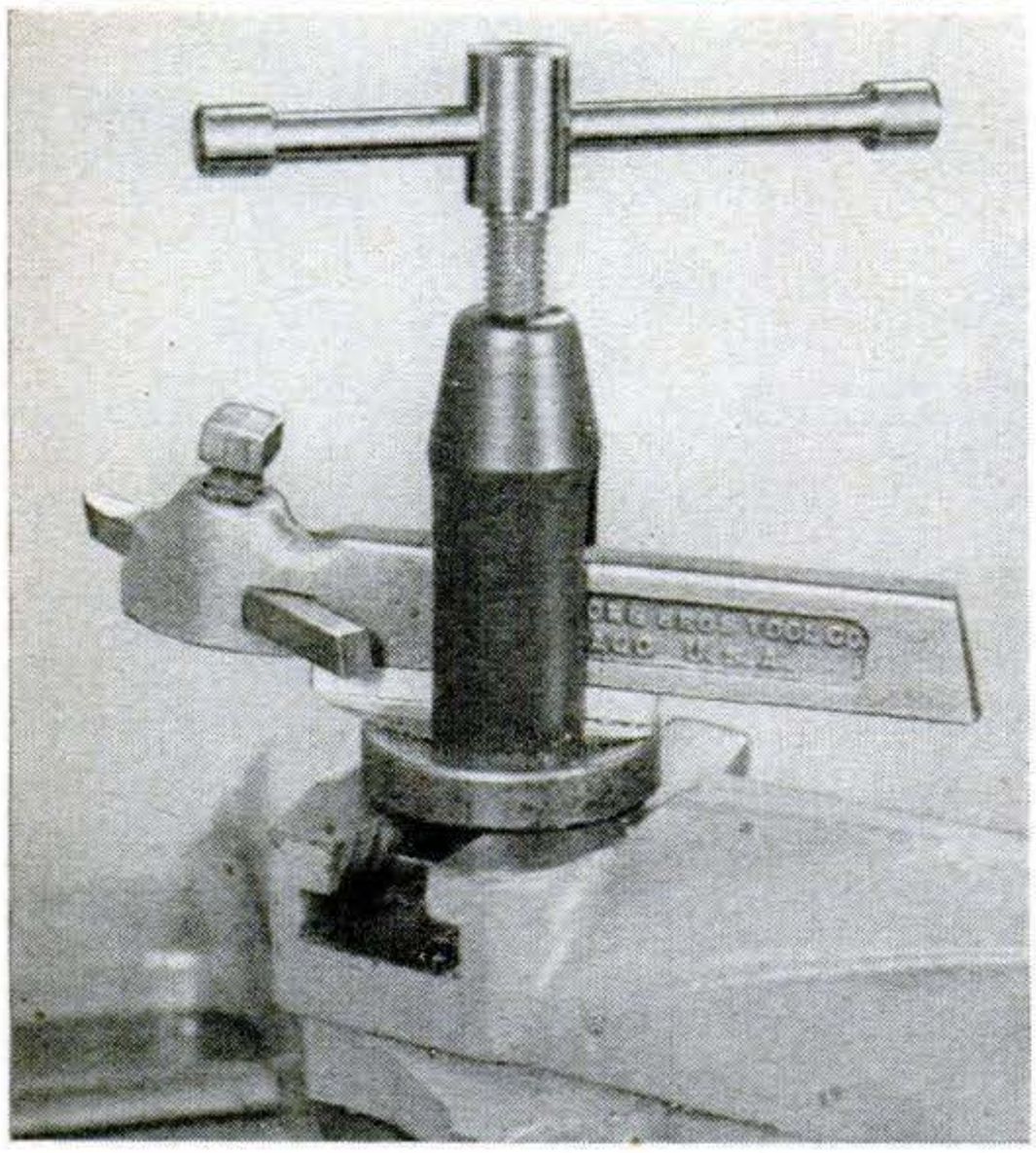
Vise Used as Furniture Clamp

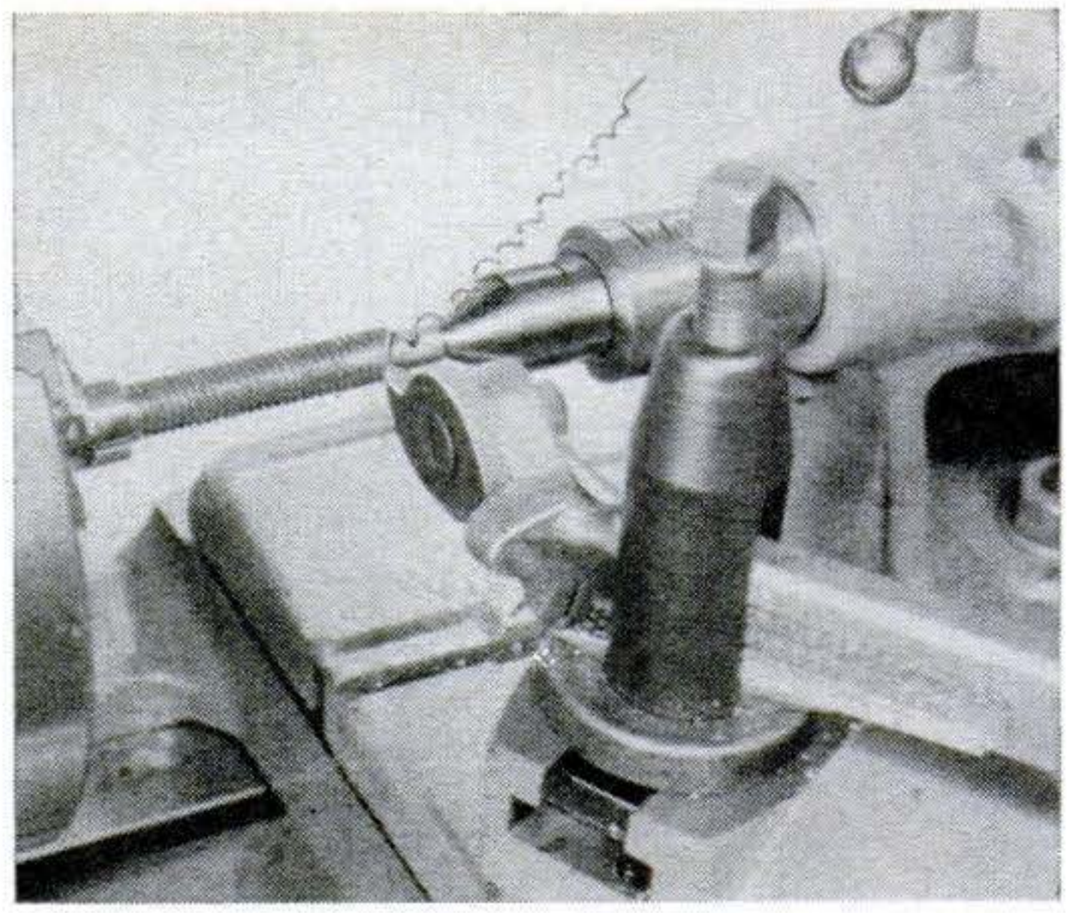
HAVING no furniture clamp suitable for gluing long pieces of work together, I improvised one by using the back of my machinist's vise, as illustrated at the right. The stationary jaw consists simply of a scrap of angle stock held tightly to the bench with a C-clamp. Blocks of wood elevate the work so that it receives straight, square pressure. The idea is especially handy in making glued repairs on long pieces such as railing spindles and the like. Do not use excessive pressure.—*Joseph Haines, Philadelphia.*

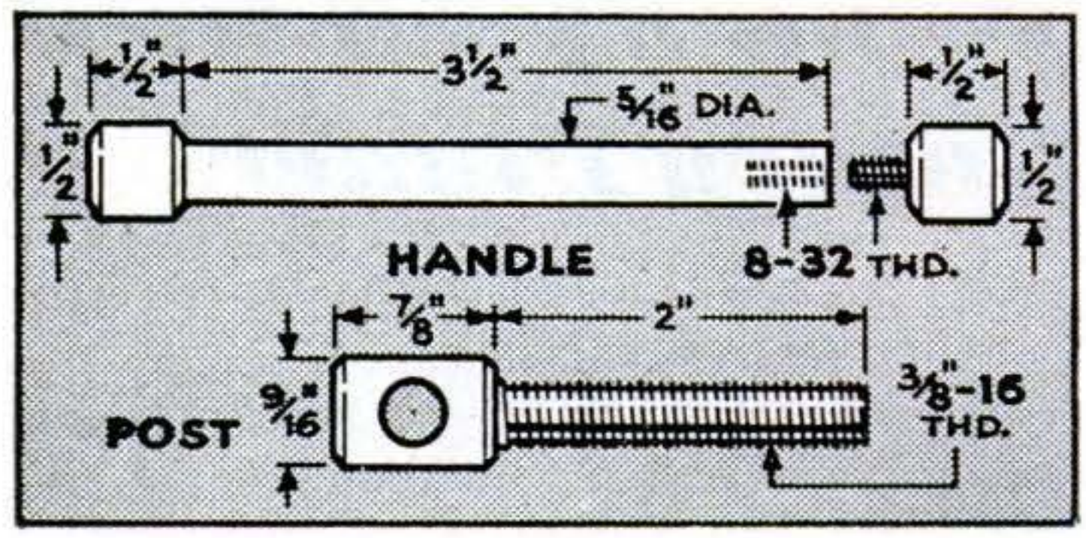


Copyrighted material

NEW SHOP IDEAS

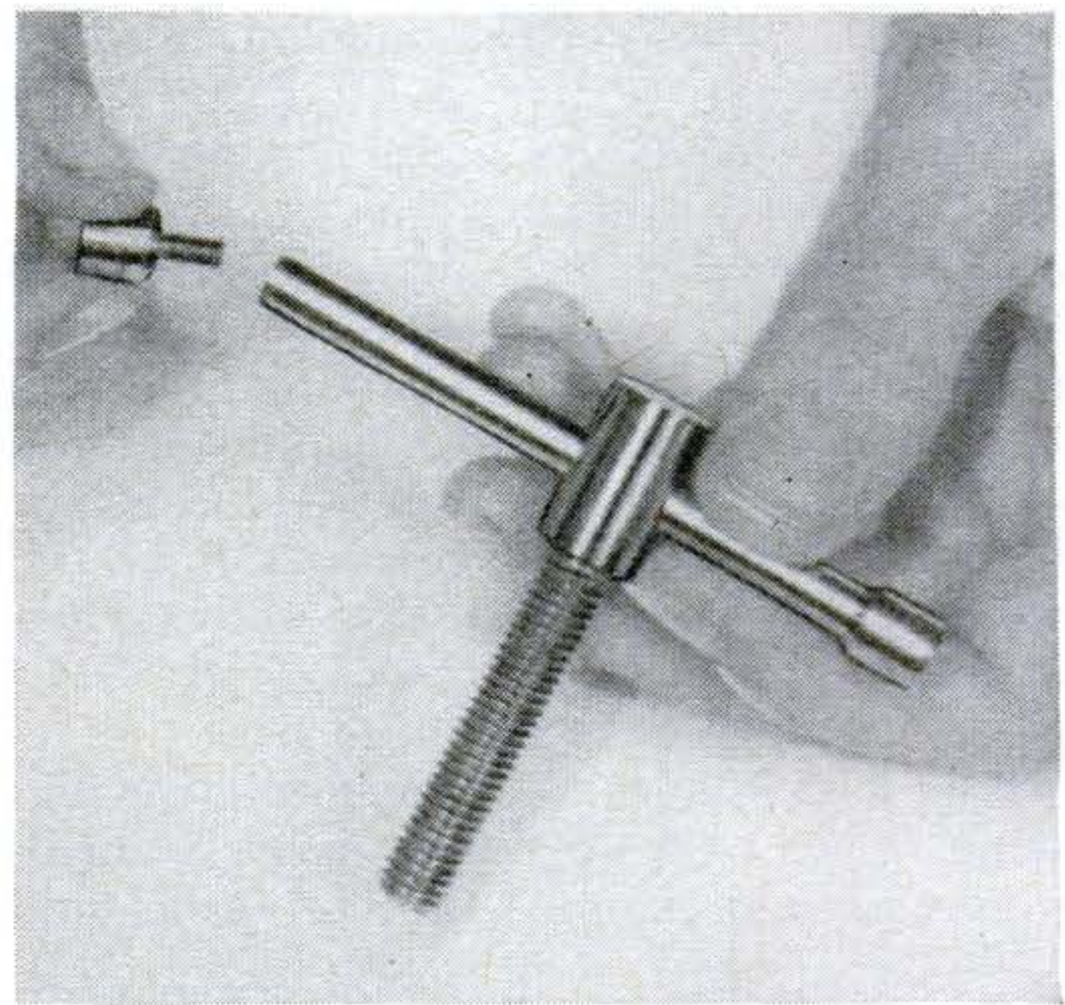


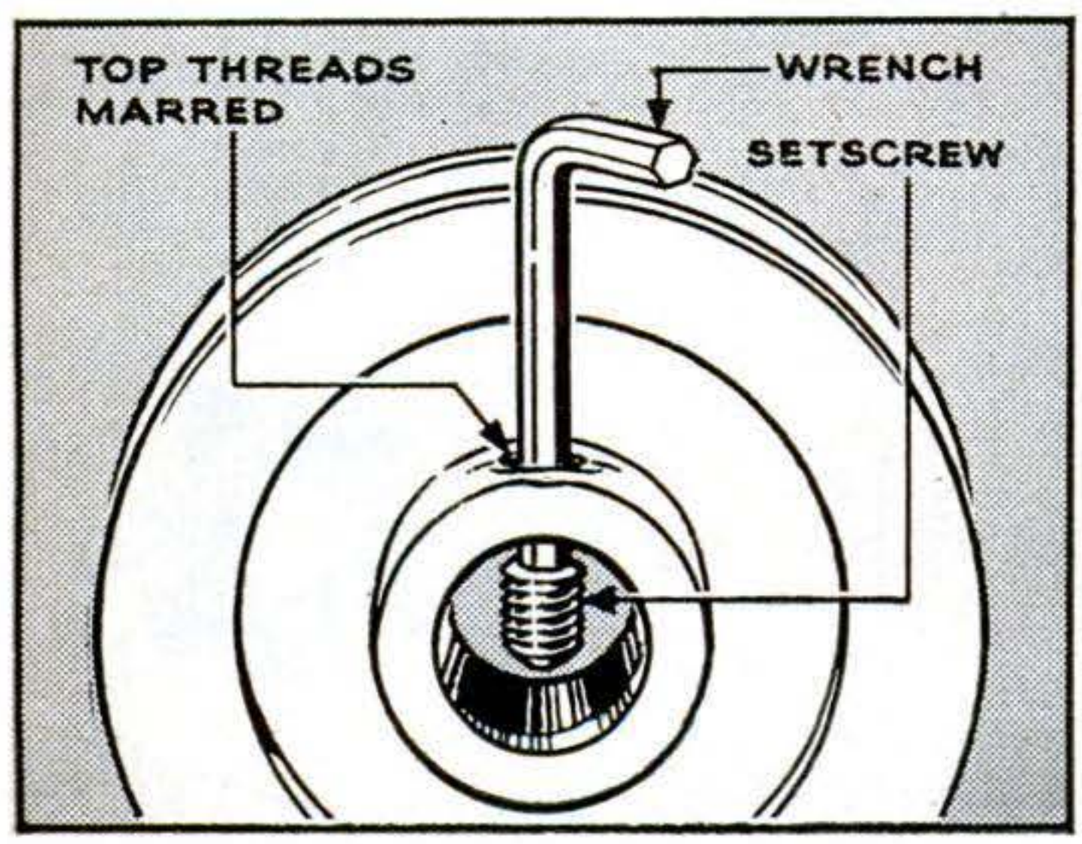




Tool Post Needs No Wrench. You don't have to search around the lathe bench for the tool-post wrench if you have this simple fitting. It's a great convenience in making quick adjustments of tool height and angle. The handle gives ample tightening leverage, and it readily slides back out of the way.

Two pieces of drill rod, one 9/16″ and the other ½″, will provide material. Or if you prefer not to turn the handle out of solid stock, it can be made by fitting two removable knobs to some 5/16″ round stock. The vertical screw can be threaded either in the lathe (upper right) or with a die; the ⅜″-16 threads specified are correct for many small tool posts.—*Henry Hanscom, Elmhurst, Ill.*

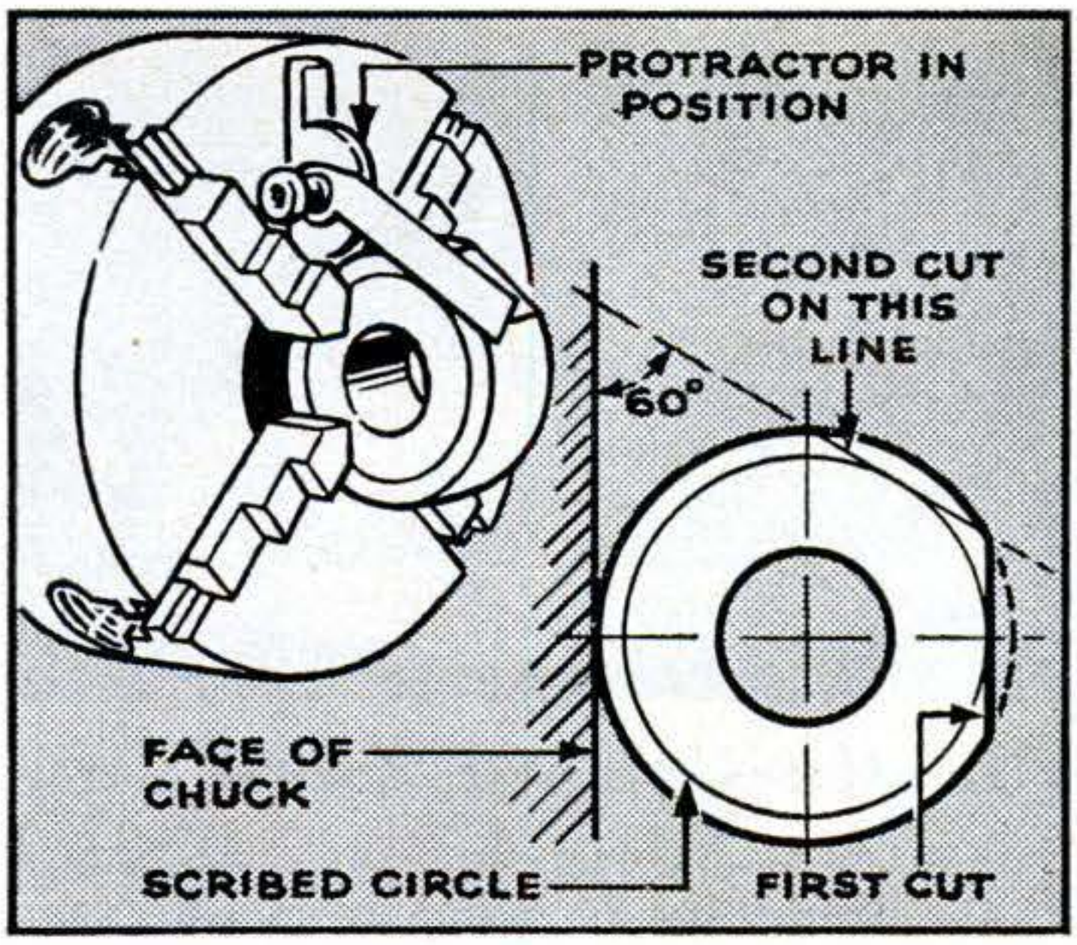




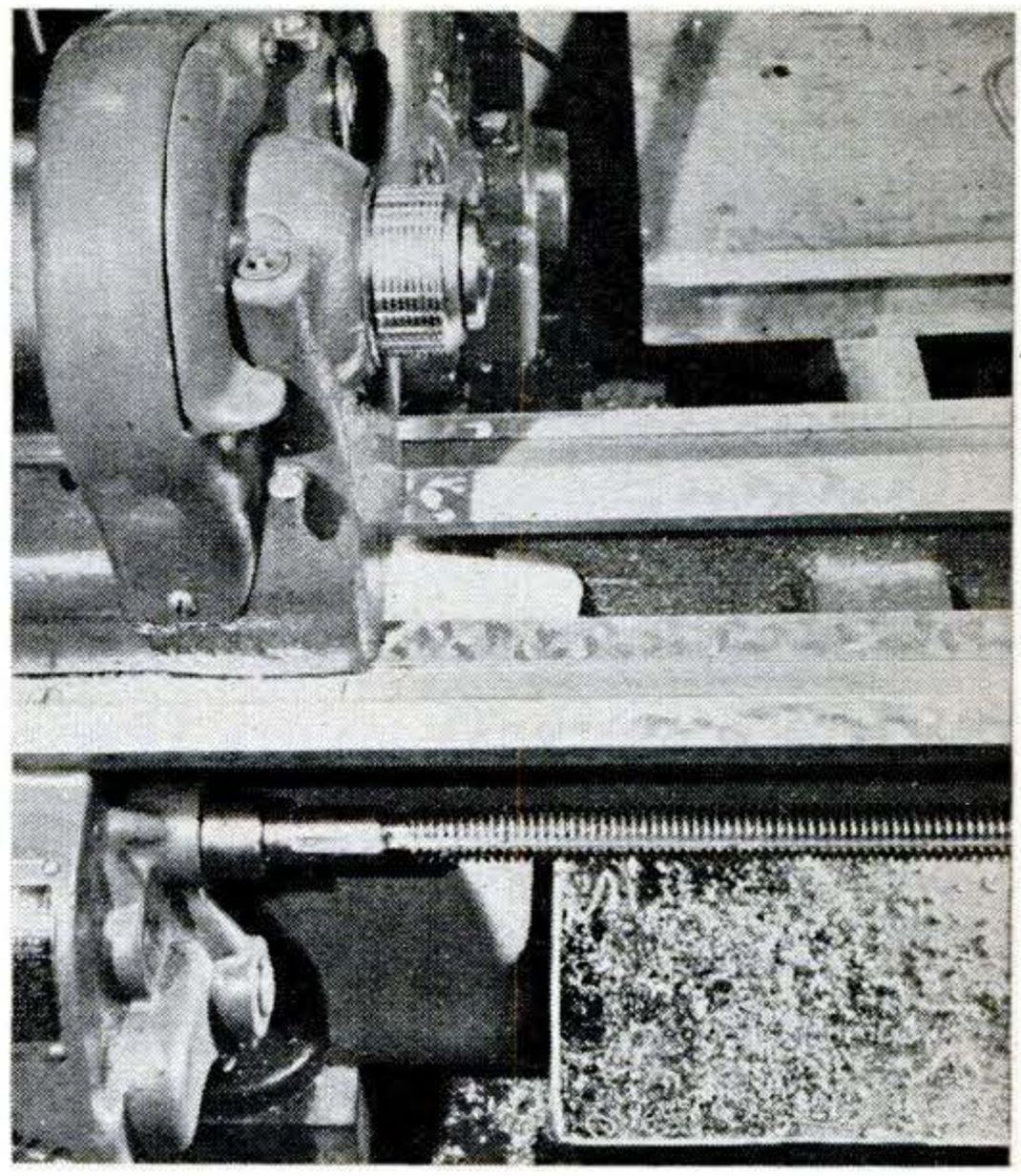
Screw Straightens Threads. Occasionally the upper threads in the setscrew hole of a die-cast pulley become so badly chewed up that the setscrew cannot be started properly. It's preferable to clean up the threads with the correct tap, but if none is at hand the kink at left will often do.

Dip the long end of an Allen wrench in some grease, insert it through the setscrew hole, fit it into a hollow-head setscrew that's been put in through the shaft hole, and carefully back the screw out from inside. As the screw comes to the damaged threads it will straighten them out.

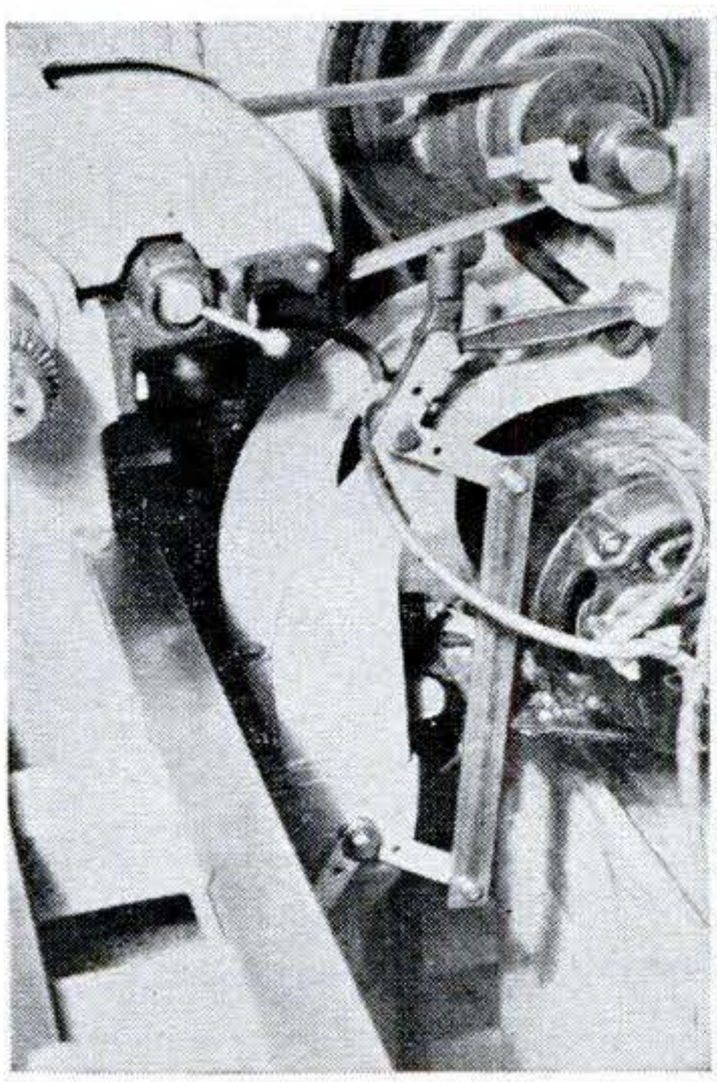
Copyrighted material

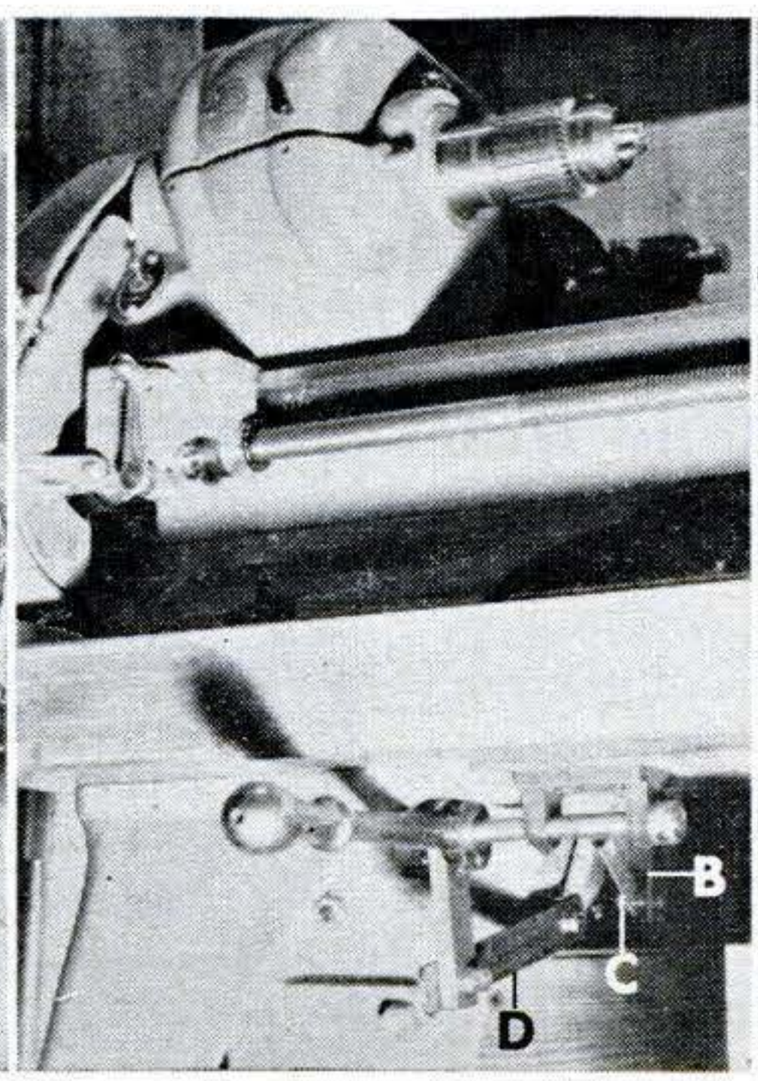


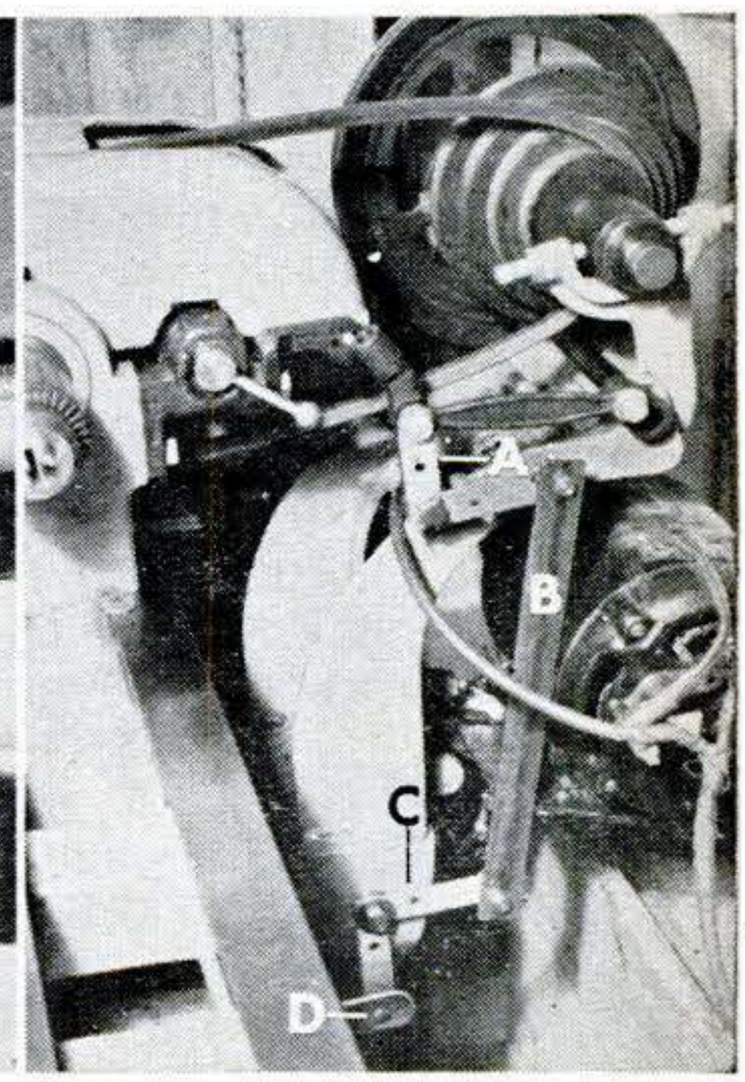
Hexing Nuts. Here's a quick way to produce a hexagonal shape on special nuts. Scribe a circle having a diameter equal to the desired distance between flats, drill and tap the nut, and then machine a flat to the line, chucking the work in the four-jaw. Use a protractor set at 60 deg. to reposition the nut for subsequent cuts. To find the diameter of stock needed, multiply the desired distance between flats by 1.15.– *W. S. Gallman, McNary, Ariz.*



Chute Diverts Chips. Pans beneath the lathe ways won't catch turnings close to the headstock. A bent piece of sheet aluminum fitted between the ways at an angle will divert chips and coolant to the pan and keep them out from under the headstock.



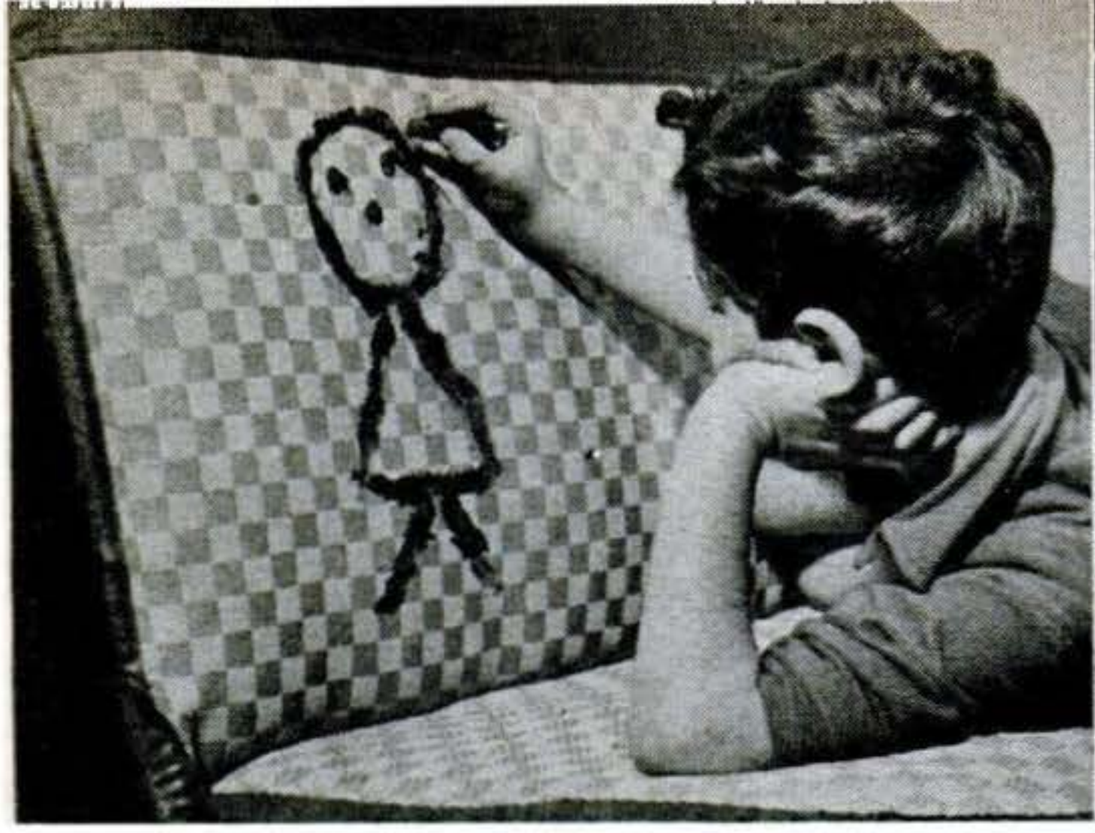


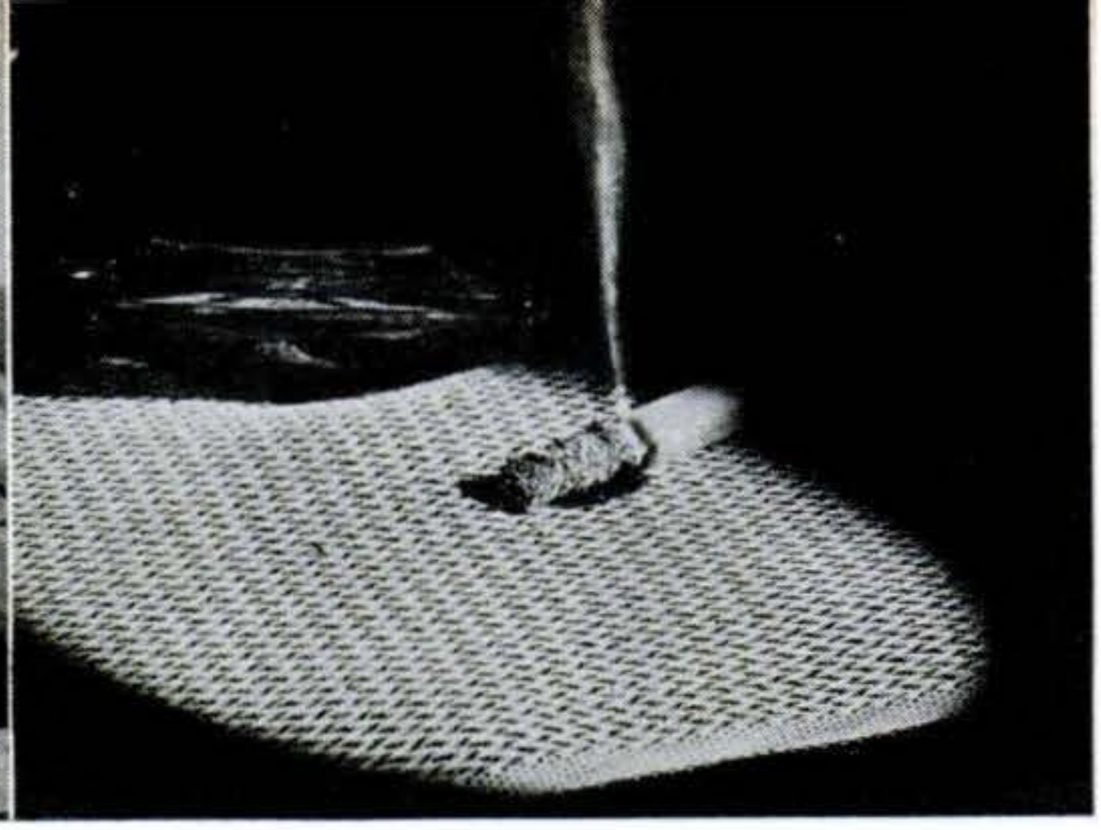


Countershaft Lever Relocated. Although any device that will release belt tension on a lathe countershaft is a convenience, the release lever on some bench lathes is located behind the headstock in an awkward and even hazardous position. With a few scrapbox odds and ends I devised a lever system that brings the control handle out beneath the bench under the headstock.

At left above the rig is in the power-on position; the center photo shows the new control lever in the same position; and at right the linkage is pictured in the power-off setting. The original lever, which protruded from where bell crank A now is, was removed. Link B connects bell cranks A and C, and link D runs to the new control lever. Only one hole, that for the pivot bolt of bell crank C, had to be drilled in the lathe itself.—*H. L. Phillips, Watertown, Mass.*

Copyrighted material





Seat Covers Woven from Plastic-Coated Yarn

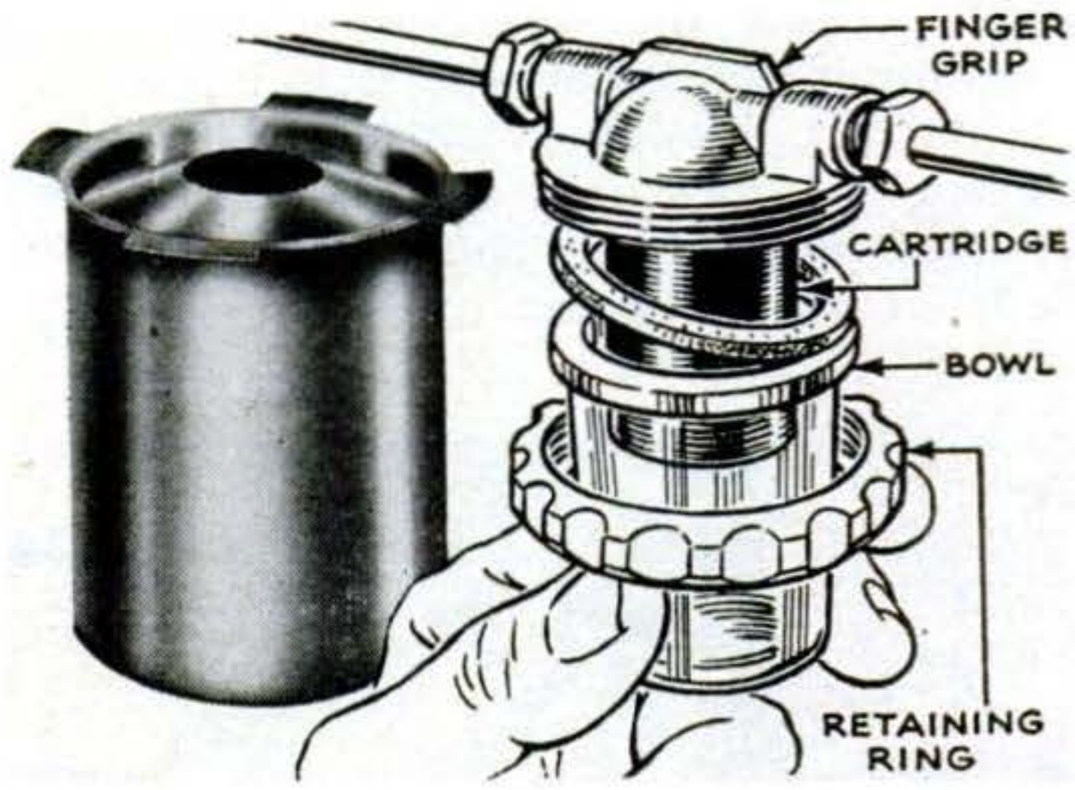
SEAT covers produced from a plastic-coated yarn called Plexon Ⓣ are fire-retardant and impervious to grease, lipstick, acids, and rust. The covers are a product of Necessities Limited, Greenville, S. C.

A cigarette does little damage and Junior's art work is easily removed with a damp cloth. Made in Greenville by Plexon, Inc., the fabric consists of rayon or cotton fibers coated with plastic solvents. The product will also be used for decorative fabrics, upholstery, and draperies.

Filter Has Replaceable Screen

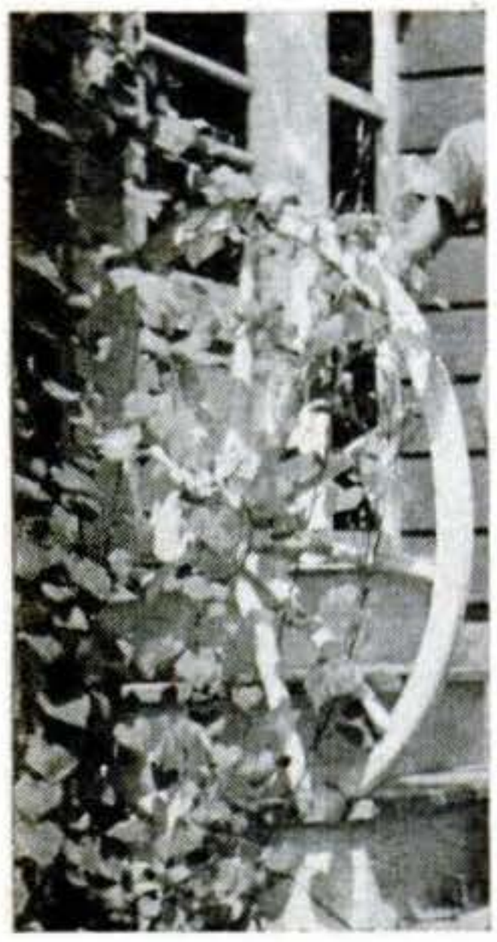
A REPLACEABLE cartridge screening element is a feature of a new gasoline filter announced by the Fram Corp., Providence, R. I. The company claims that when the element becomes clogged it's easier and cheaper to replace the cartridge (inset) than to clean the usual type of screen.

A finger grip lessens the chances of twisting the gas line when taking the filter apart, and the threaded retaining ring may be loosened by hand.

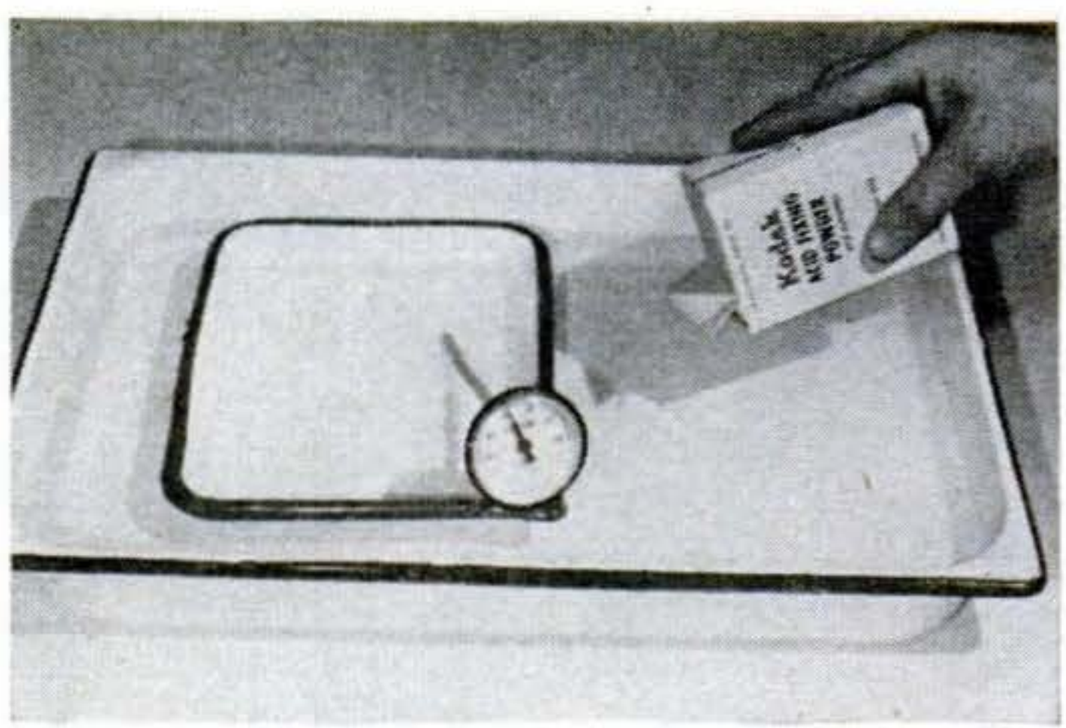


Old Wheel Used as Hand Rail

BELOW is an addition to our back porch steps that's both decorative and useful—a wagon wheel cut and fastened to the steps and side of the house as a hand rail. During the summer, morning-glory vines grow through the spokes.



A template for cutting the wheel was made by fitting scraps of stock to the steps and tacking them together. The wheel then was installed with lag screws. Plywood disks were placed over the hub and the wheel painted to match the house.—*Karl Greif, Binghamton, N. Y.*



Hypo Cools Photo Solutions

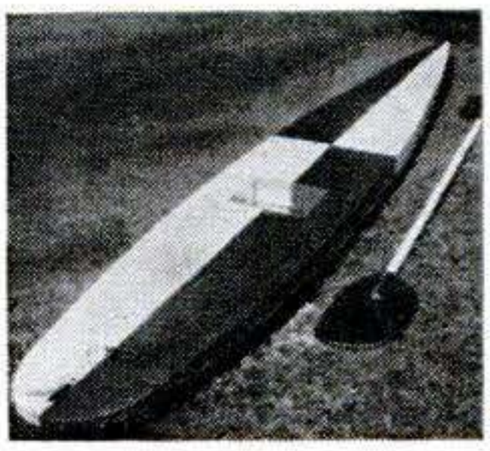
A TRICK of chemistry will help you keep photo solutions at working temperature in warm weather. Place the developing tank, tray, or bottle of solution in cold water and toss in hypo crystals. The temperature will decrease until the water is saturated. Then pour it out and begin again with fresh water. —*Jack Wilson, San Pedro, Calif.*

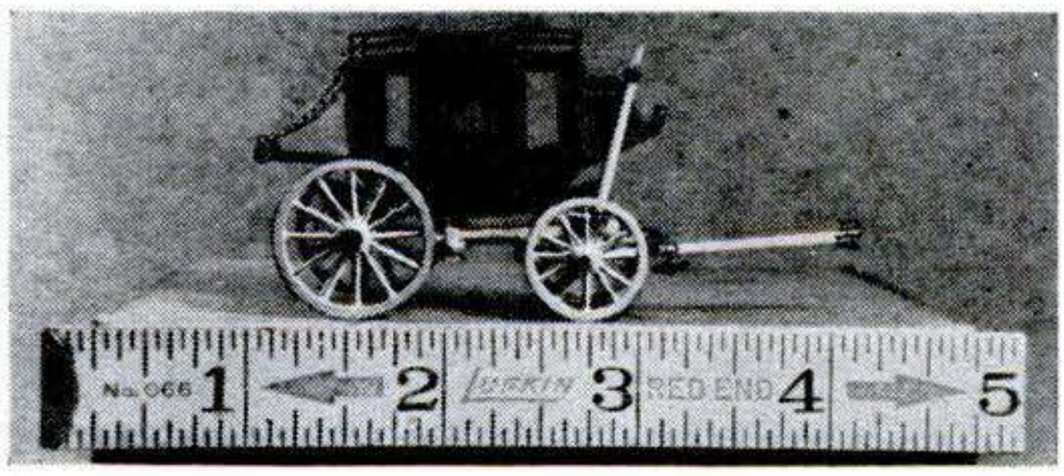
Copyrighted material

Craftsmen at Work

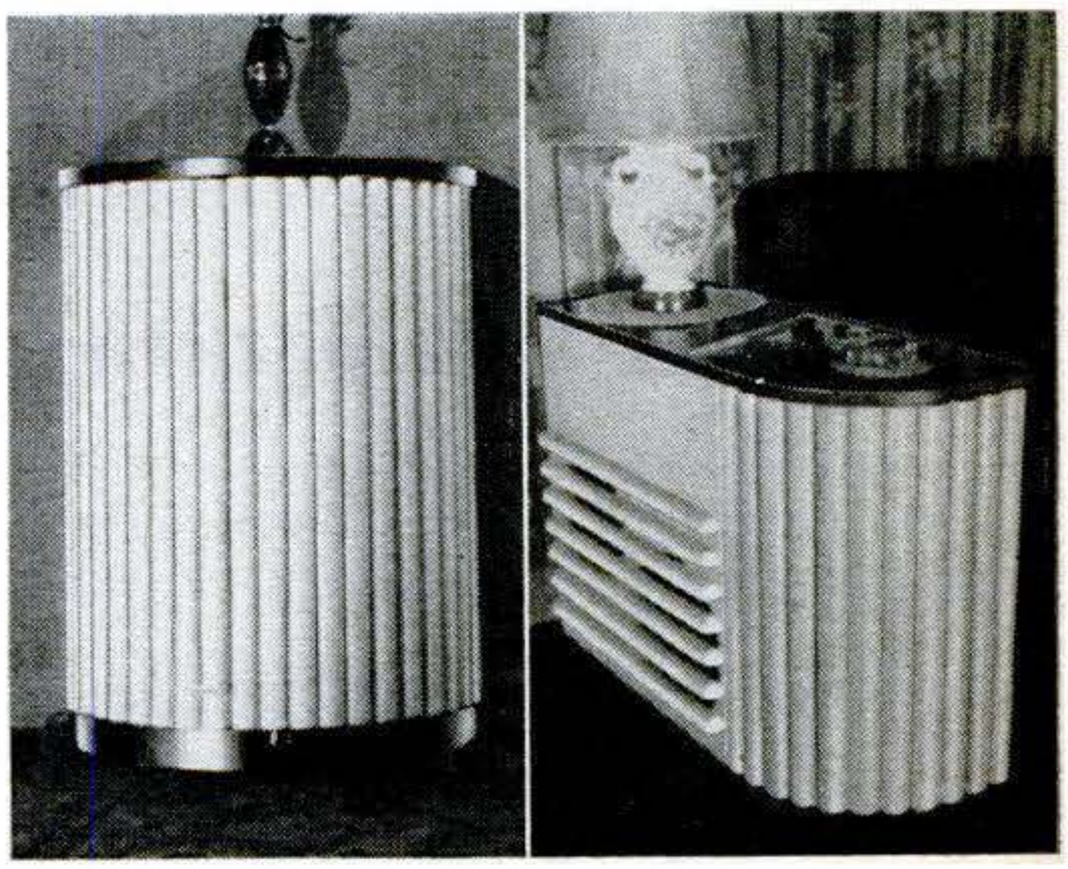
Three-Year-Old Runs Tractor. Powered by a ¾-hp. gasoline washing-machine engine, this little tractor was built by August Dobert, of Nashville, Tenn., for his three-year-old son. Pipe was welded together for the frame, and the steering rod runs through the frame, making the bend by means of bevel gears. The drive is a round leather belt from engine to countershaft, and a chain from countershaft to the right rear wheel. A pedal engages the drive and also acts as a brake. A trailer is easily pulled.

Surfboard Has Viewer. In building this surfboard from PS plans, Charles V. Ogilvie, of Jamaica, B.W.I., included a plate-glass panel through which the rider may view the ocean floor. Since the board is intended for use mostly on calm water it's equipped with a paddle. Framed with cedar, the board is made of plywood.





Stagecoach Measures 3″. Despite its size, this midget model includes much detail of the picturesque stagecoaches that once thundered along the trails of the old West. Built entirely by hand, it is the work of C. W. Frey, of Pittsburgh, who scaled it down from plans that appeared in POPULAR SCIENCE. It has a wheelbase of 1¼″ and other dimensions are scaled accordingly.



Cabinets Faced with Molding. Two unusual radio cabinets built by Douglas Bates, of Philadelphia, are faced with 1½″ half-round molding. Coated with ivory enamel, both harmonize well with modern furniture.

In the one at the left, the molding is assembled on two doors that have a curved framework, and these swing open for operation of the radio. Half-round fluting also was used for the end of the chairside model, and composition board for the side. In each case a top was cut from an old radio cabinet and the walnut finish retained. The toe recess of the semicircular model consists of several layers of stock built up to 3″ thickness.

Copyrighted material

Camera on Broom Shoots a Strike

NEWS photographers do a lot of ingenious and strange things to get photographs that are a little out of the ordinary, and here's a case in point.

An editor for News of the Day newsreel figured that something different might result if a movie camera could be made to chase a bowling ball down an alley, showing the ball in flight and the knockdown of the pins. The assignment was turned over to cameraman Norman Alley.

He solved the problem by setting up his lights, taping the camera to an ordinary broom, and then chasing the ball down the alley in his socks. The inset shows the strike he pictured. A still camera might be employed in the same way for single shots by tripping the shutter with a cord.

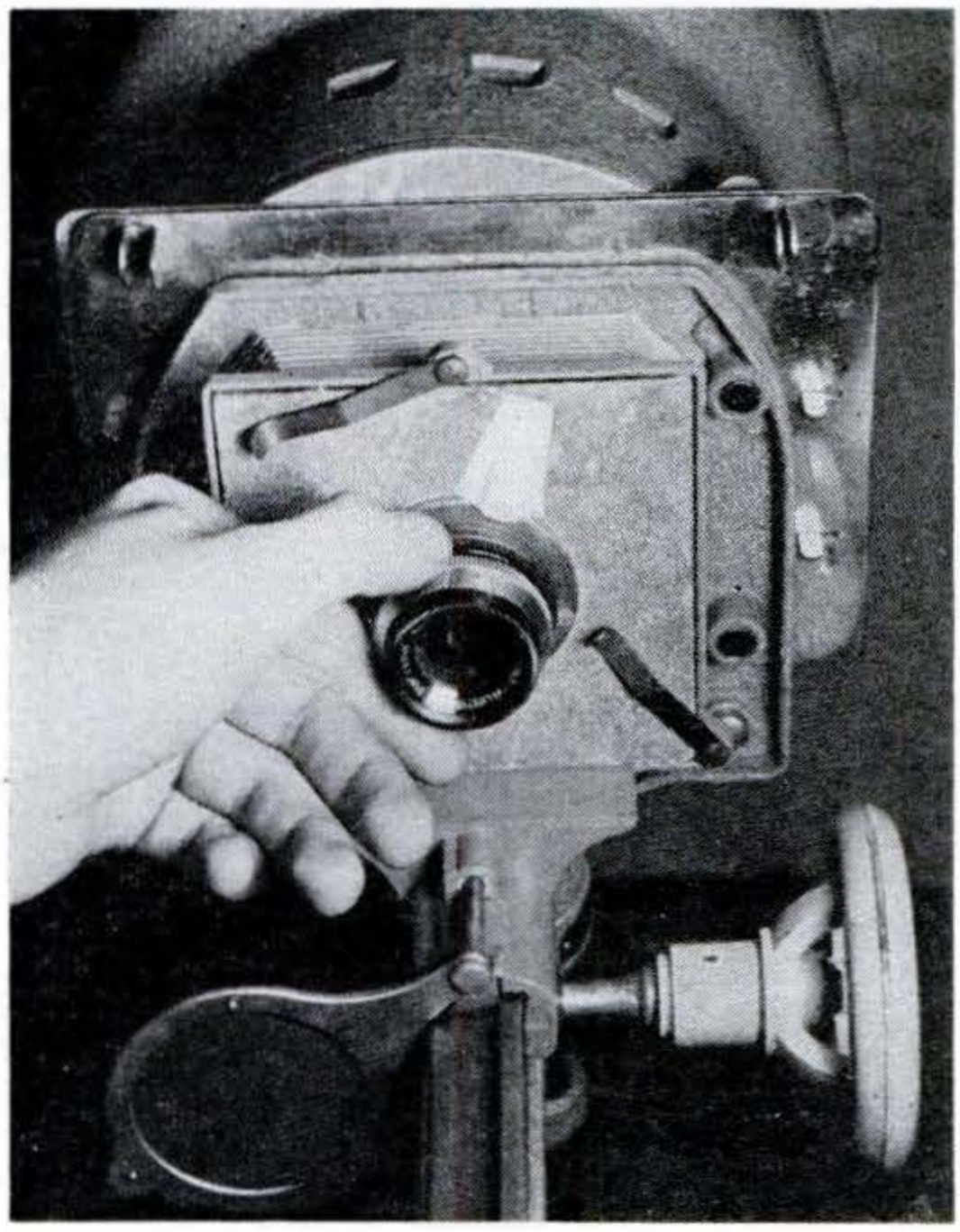
Light Streaks Show Night Activity at Airport

TIME exposures made at night may frequently be given additional interest by recording the movements of passing vehicles as streaks of light.

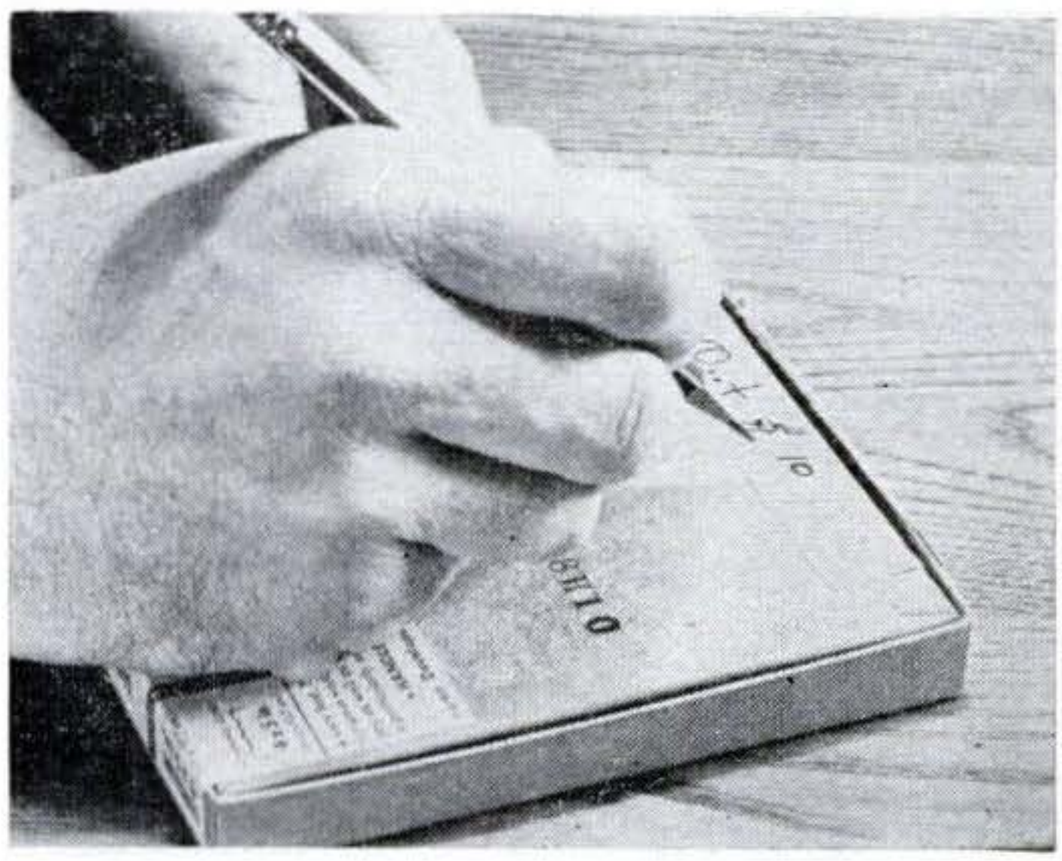
Here's a striking example of such a photograph. It represents a 30-second passage of time at LaGuardia Field in New York City. Made with a 4″ by 5″ camera at f/8, the photo shows the path of light made by a plane rising from the field beyond the hangars, as well as rows of light left by cars entering and departing from the parking area.

Copyrighted material

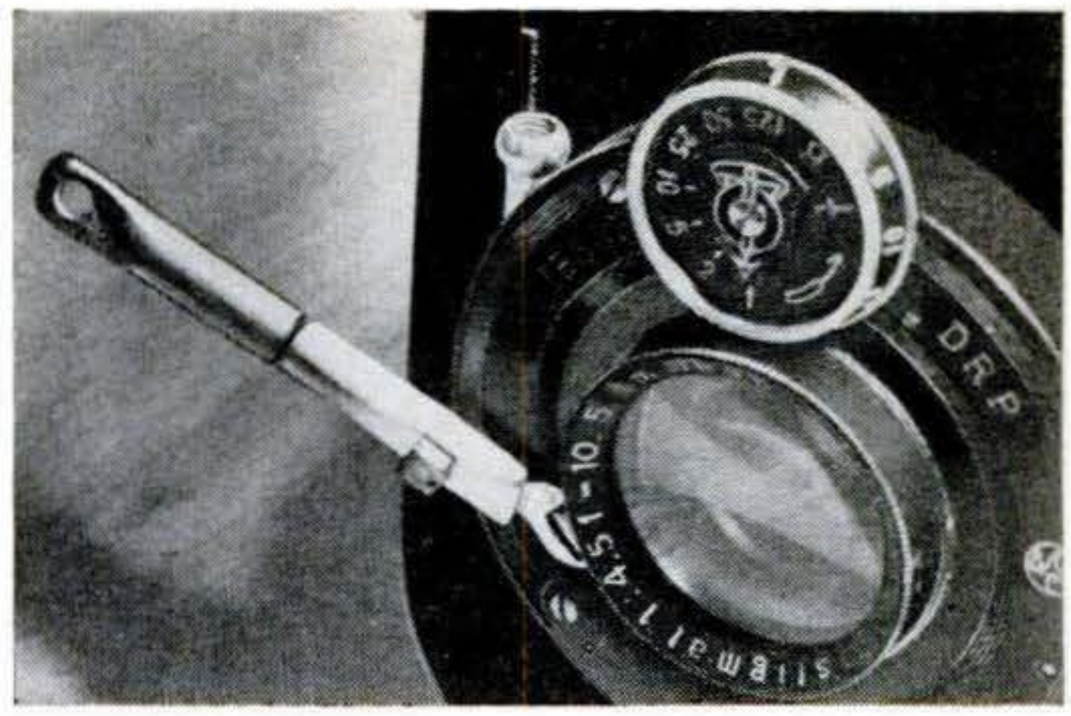
PHOTO IDEAS AND EQUIPMENT



Light Shows Diaphragm Mark. So that you can see to set the aperture of your enlarger after focusing, drill a ¼″ hole in the lens board close to the index mark. Then cover the hole with a slanting cardboard or metal hood to direct the light from the enlarger toward the diaphragm figures on the lens barrel. Be careful that no light leaks downward.—*Hank Stockert, Chicago.*

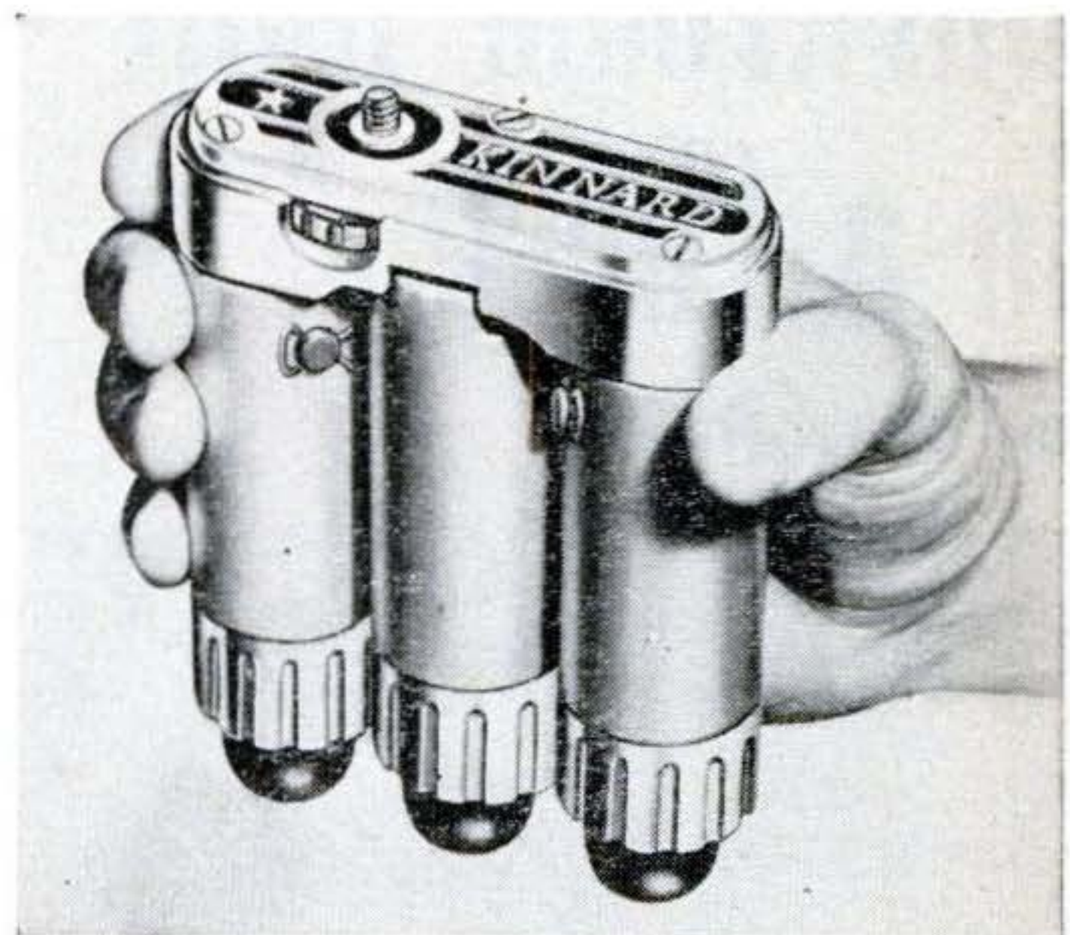


Keep Film Inventory. How much cut film remains in a box often is a question. Keep inventory by recording sheets removed.—*Glenn A. Wagner, Delmar, N. Y.*



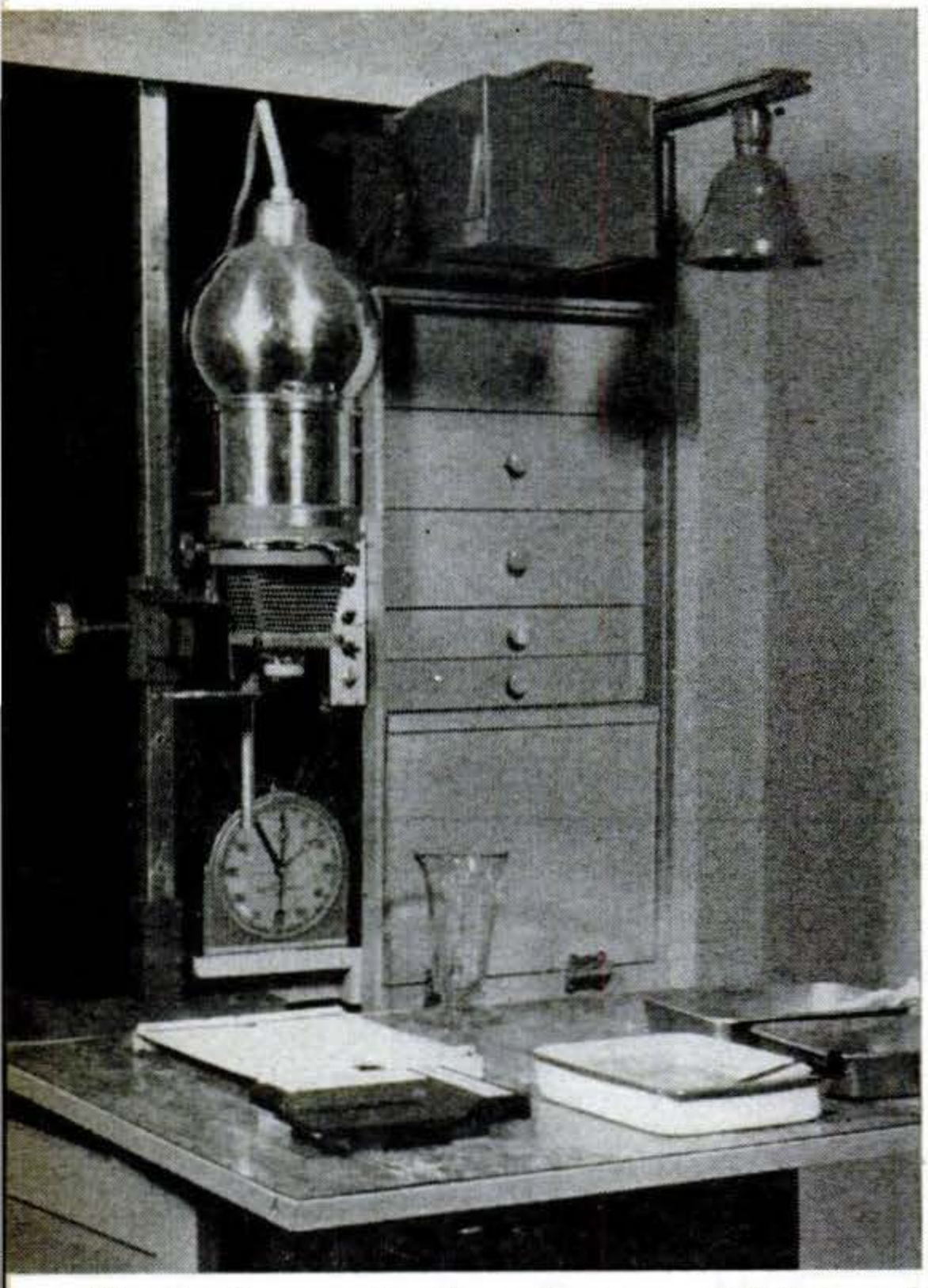
Lever Operates Shutter. A short length of small aluminum tubing, flattened at one end and then attached to the shutter release, will give more sensitive control of the release. It may be fastened by drilling a hole through both tubing and release and inserting a screw. For remote-control shots with a string, drill a hole in the flattened end of a second piece of tubing and thread a headless bolt into the other end. This can then be temporarily inserted in the permanent lever.—*Richard F. Trump, Ames, Iowa.*

Test Your Flash. Each time you mount a solenoid-type flash gun on a roll-film camera, cap the lens and fire the shutter with the synchronizer. This simple test will save film in case you have a poor connection.—*A. H. Selkowitz, University, Ala.*

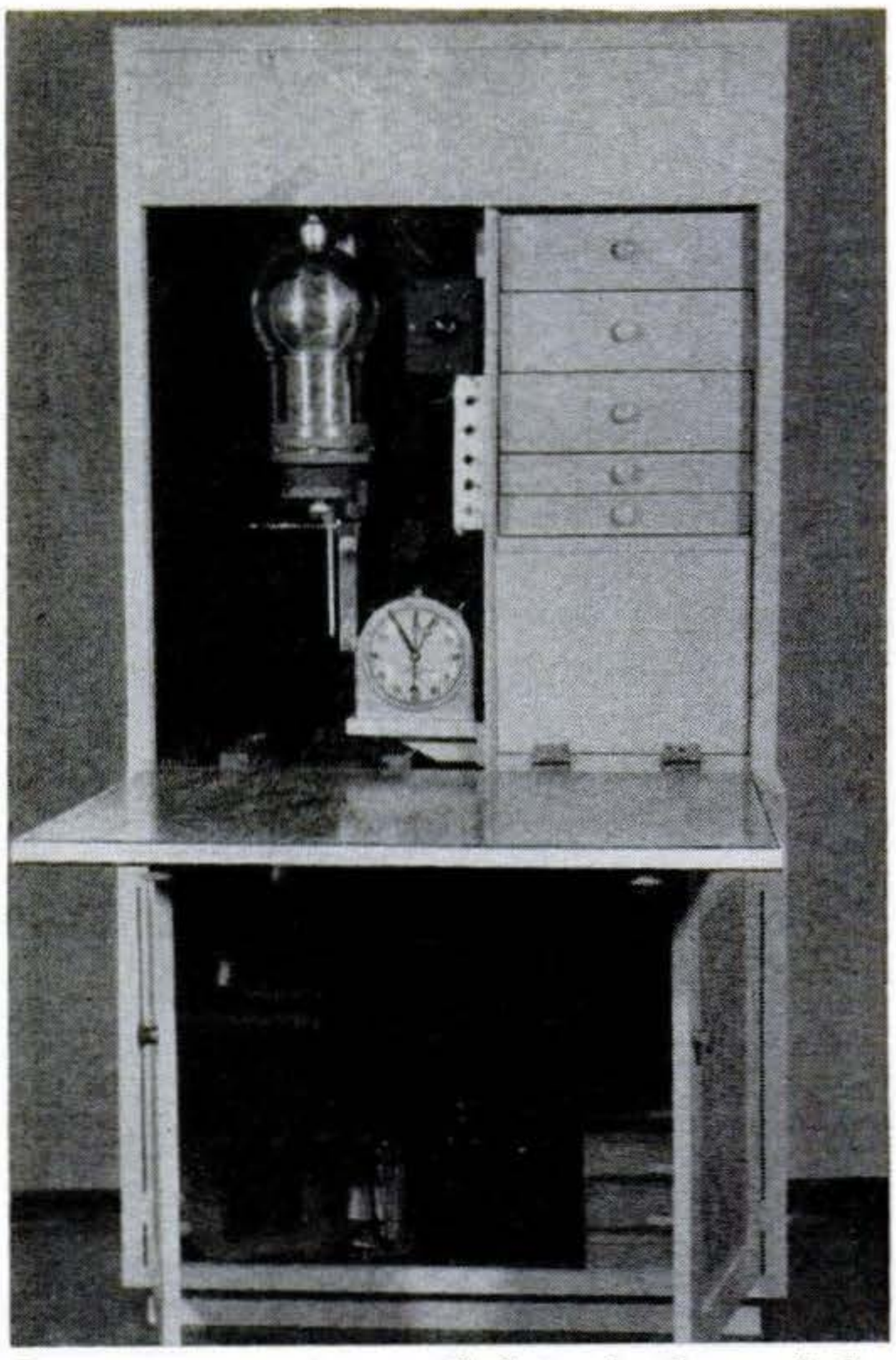


Tripod Fits in Pocket. A new tripod manufactured by the Kinnard Company, of Milwaukee, Wis., has legs formed of a spiral coil of stainless steel. When extended, the legs are said to be capable of supporting even a heavy camera. With the legs telescoped, the tripod is so compact that it can be easily slipped into a pocket.

Copyrighted material



Ready for work, the enlarger, safelight, and white light are all pulled out of the cabinet.



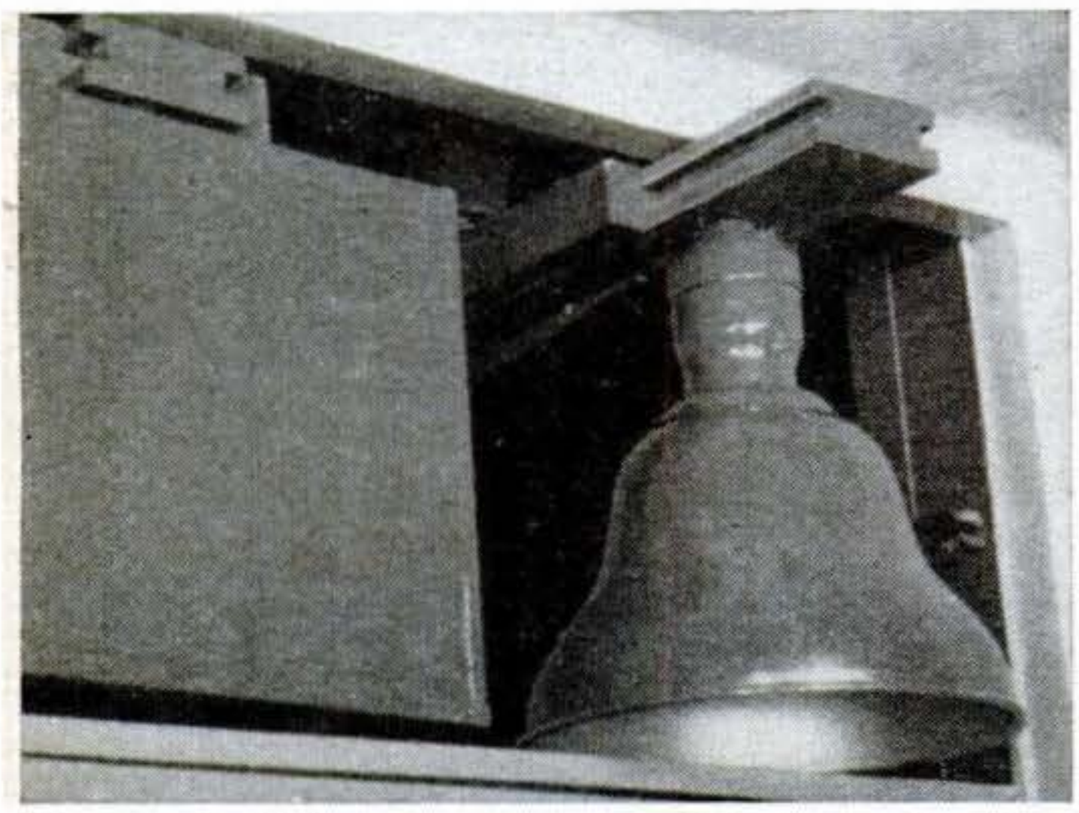
Storage space is provided in the base of the cabinet for chemicals, trays, and other items.

Darkroom Built in a Chest

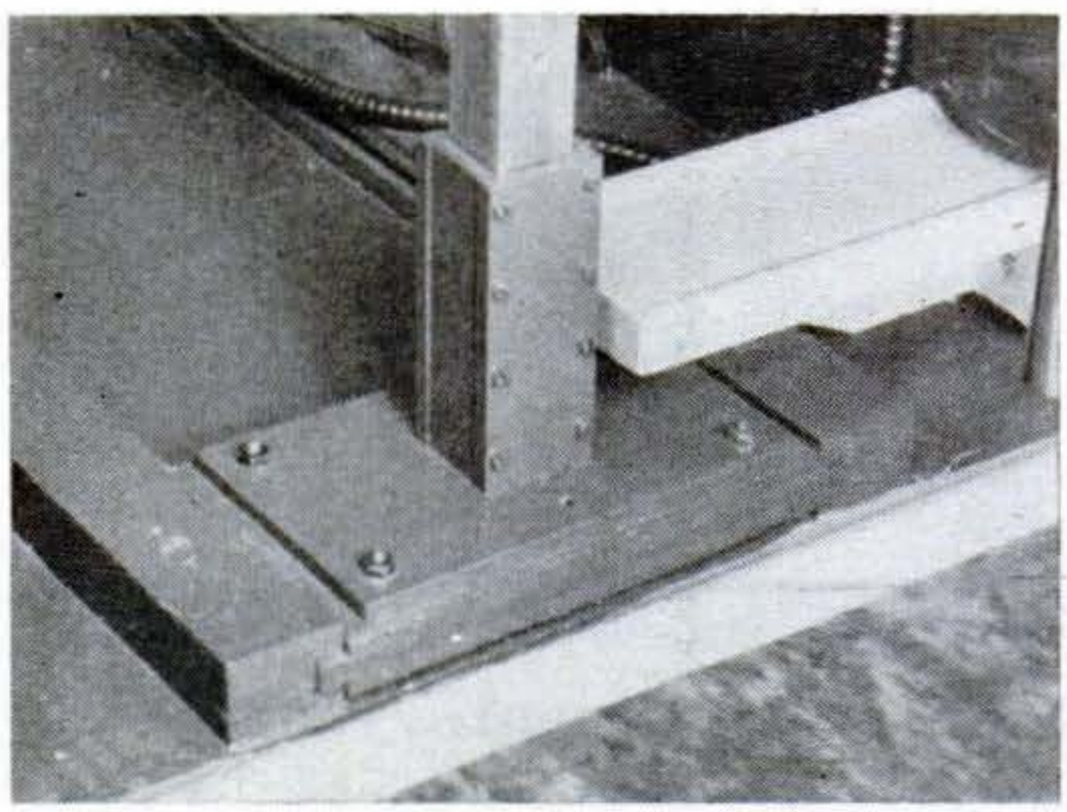
By A. H. Honest

HERE'S a solution to the space problem of those amateur photographers who must work in the kitchen or bathroom because of lack of a darkroom. All necessary equipment and supplies may be stored in the cabinet and you can get to work without loss of time.

Built around the enlarger, the chest is 20″ deep, 36″ wide, and 72″ high, but these dimensions may have to be altered to suit



Grooved slides support a safelight and white light. A panel 8″ wide encloses this section.



The enlarger likewise is mounted on a grooved slide. A timer rests on the narrow shelf at right.

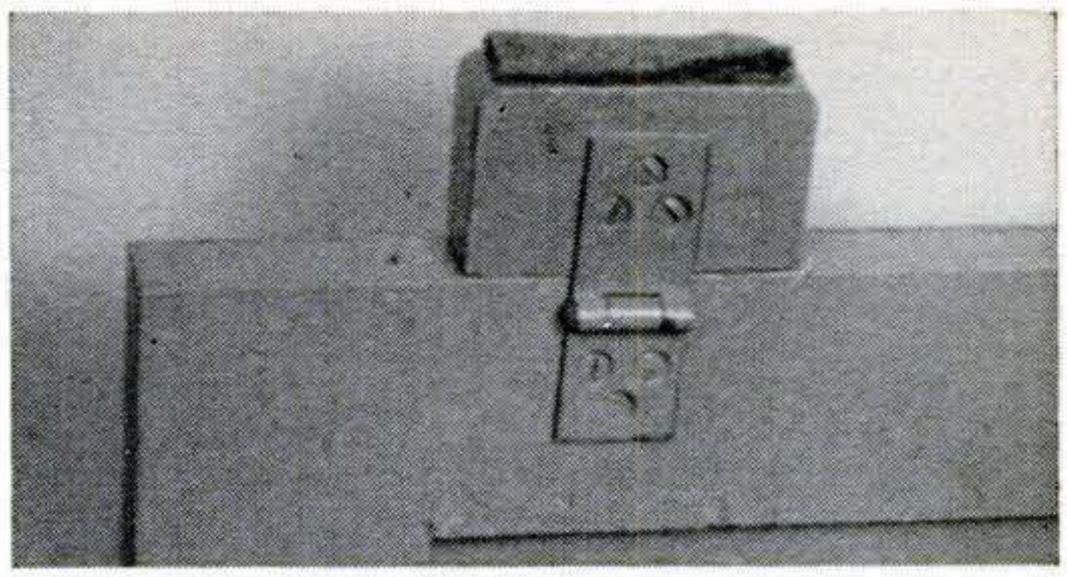
Copyrighted material

your enlarger. In this case, the section above the hinged work table measures 38″, but this dimension might well be extended to take a taller enlarger. Except for ¼″ plywood in the door panels, ¾″ stock was used.

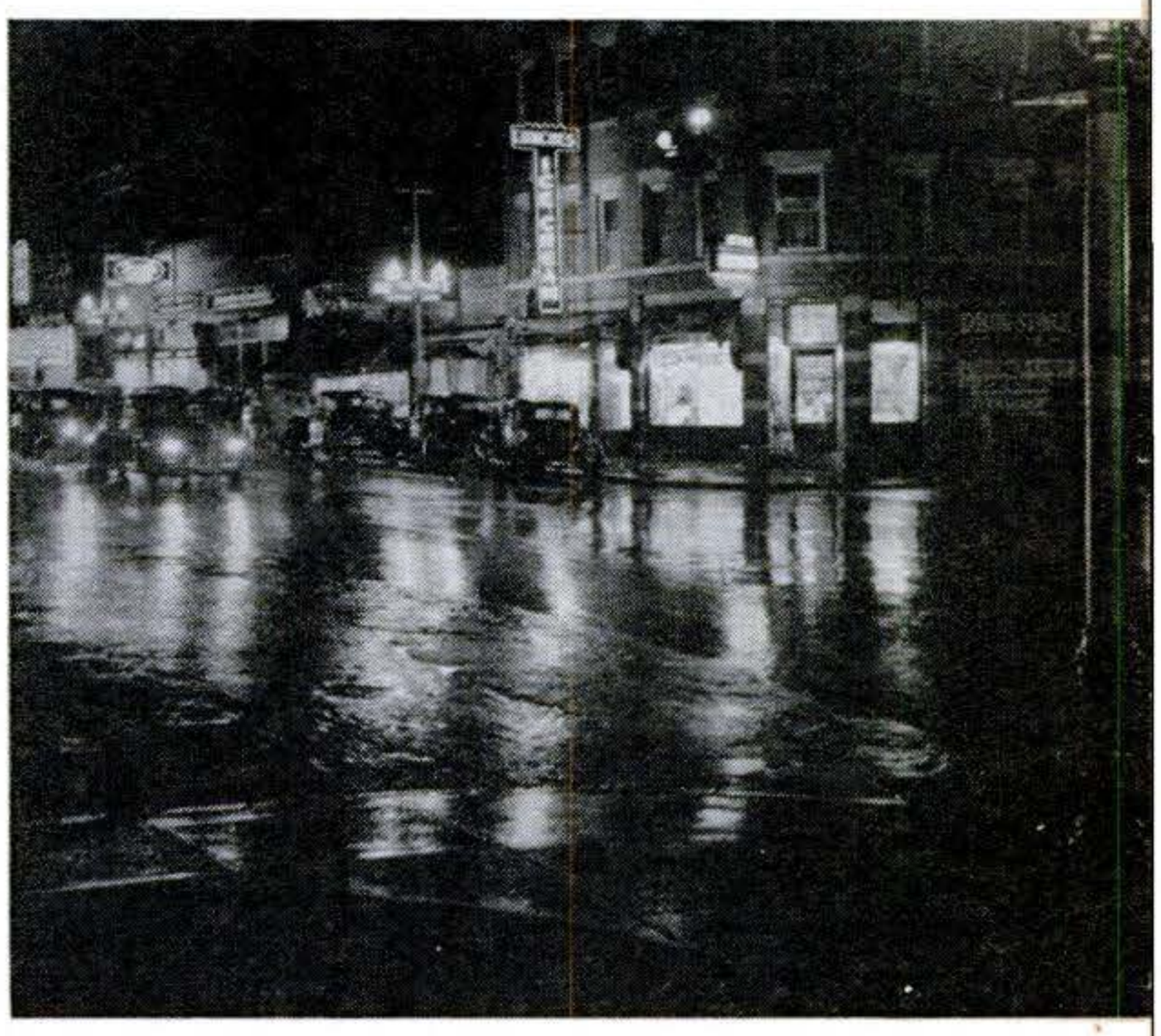
Five small drawers in the upper section accommodate small accessories. Below these is a paper safe—five shallow drawers with a spring-hinged panel in front. A switch panel is located on the upright partition.

A work table is provided by lowering the upper panel until it rests on hinged blocks on the two opened bottom doors. The remaining 8″ wide board at the top of the chest is removed separately. This two-part front was adopted to keep the work table from being too deep to reach across when lowered. The narrow panel is held in place by a few clips.

Removed from its baseboard, the enlarger post was rigidly mounted on a grooved-slide arrangement. The sliding member of this is made of 1″ stock and the track is of 1¼″ stock. Similar slides built from ¾″ material are used at the top of the cabinet for the two lights. Linoleum cemented to the table makes a good working surface.



A hinged block atop each door holds the work table level. Note felt cushion on the block.

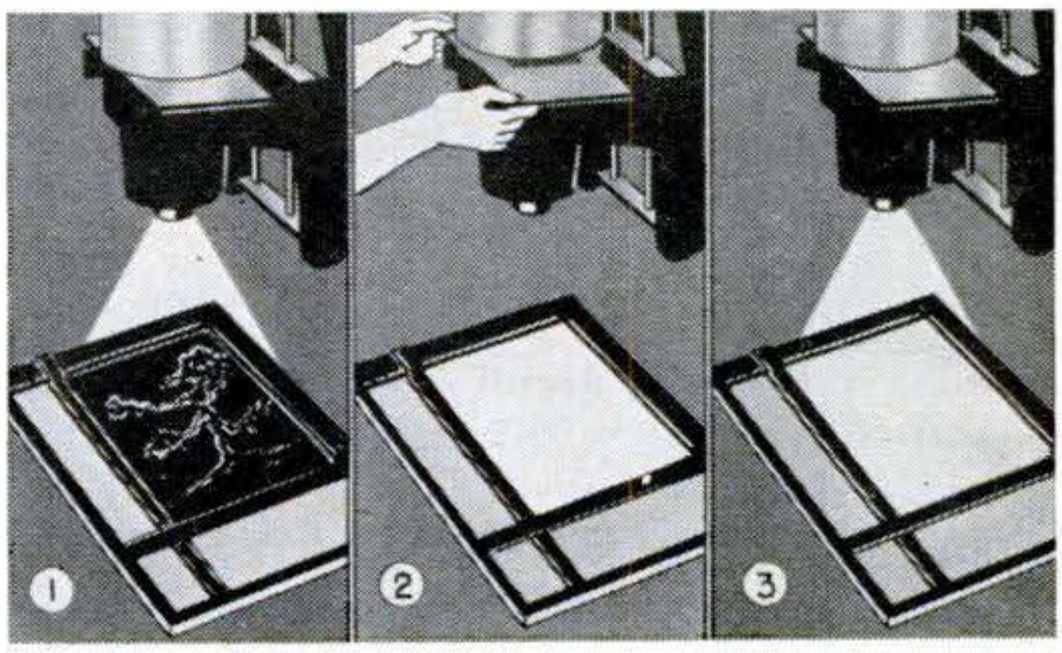


Flashing a Print Reduces Excessive Contrast

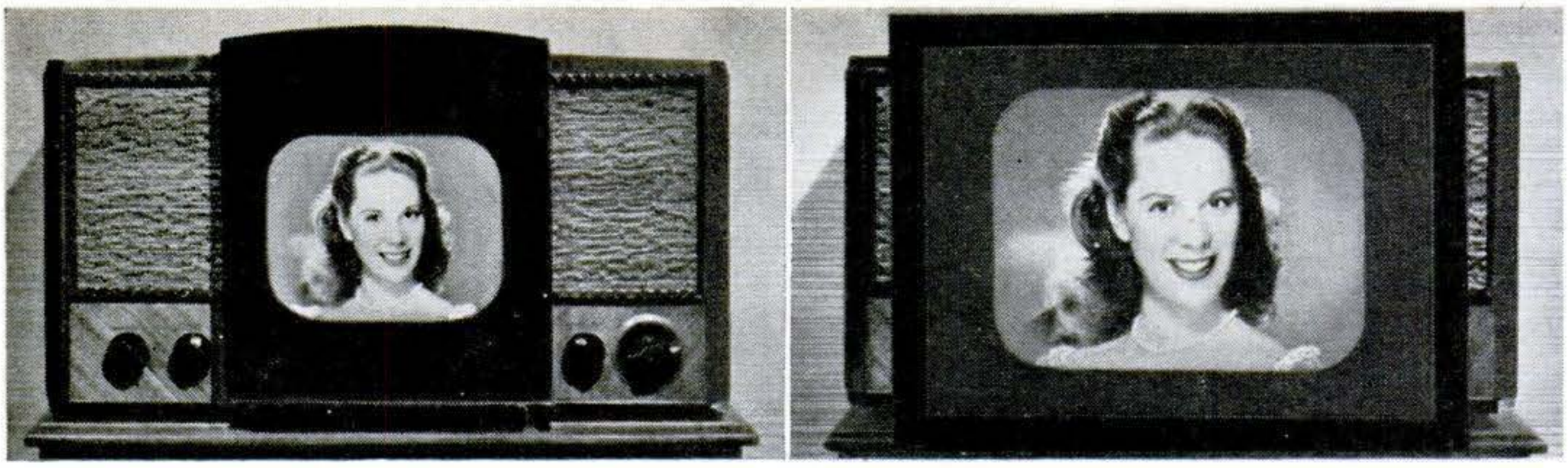
ALTHOUGH you may not often need to flash a print, this simple technique can be a great help sometimes. The rainy night scene shown here is a good example.

The straight print at the left displays the extreme contrast characteristic of night scenes in the city. The one at the right, made in the same way except for flashing, shows a reduction of light flare without loss of detail.

When you find a negative that needs flashing, make an enlargement in the usual way (1), allowing normal exposure for the negative. Then remove the negative (2) without disturbing the easel and return the carrier to position. Next (3) give the paper a very brief flash of the enlarger light. Develop the print in the customary way.



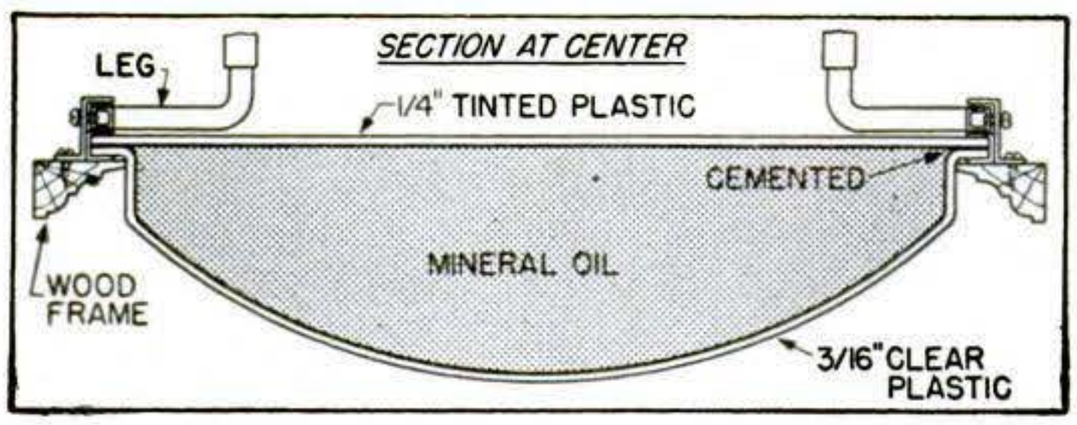
Copyrighted material



Left above, screen image of a 10″ television tube; at right, same image seen through a lens.

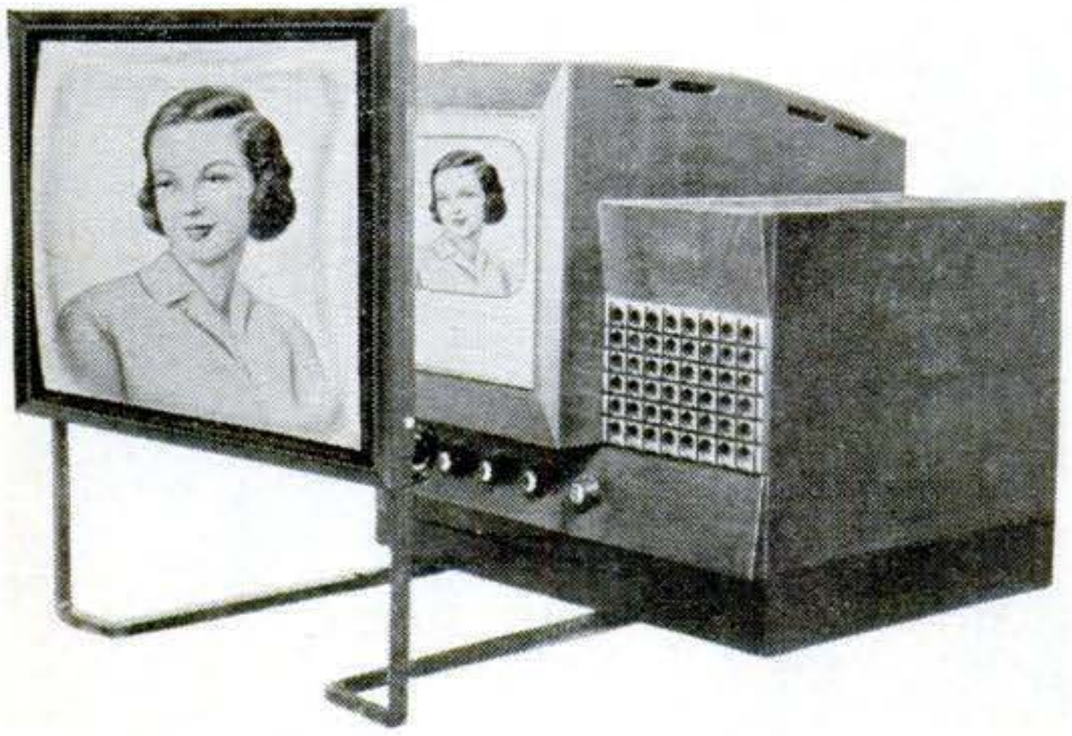
Lenses Magnify Television Images

TAKING advantage of the optical properties of clear plastic and mineral oil, outsize magnifying lenses afford bigger television images from modest screens. Units made thus would be prohibitively costly if made of glass. The Tele-Vue-Lens Ⓣ shown in front of a 10″ receiver at right above magnifies image area about three times. It's offered by Walco Sales Co., East Orange, N. J., at $60.

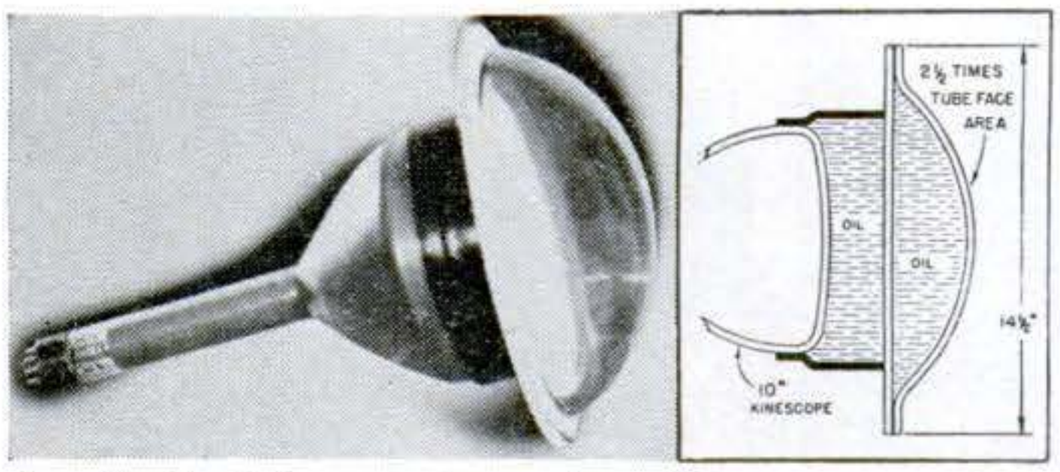


Blue-tinted plastic is used for the rear element of the Vue-Scope Ⓣ, made by Celomat Corporation of New York, to reduce glare. Shown at the left, it is priced at $20 to $60, depending on the model.

Both these lenses are attached by sliding brackets under the receiver. The All-Vue Ⓣ, made by Liquid Lens Corp. of Flushing, N. Y., fastens on the tube. It magnifies 2½ times and permits wide-angle viewing.



Tinted plastic is used as the rear sheet of this magnifier to reduce any tendency toward glare.



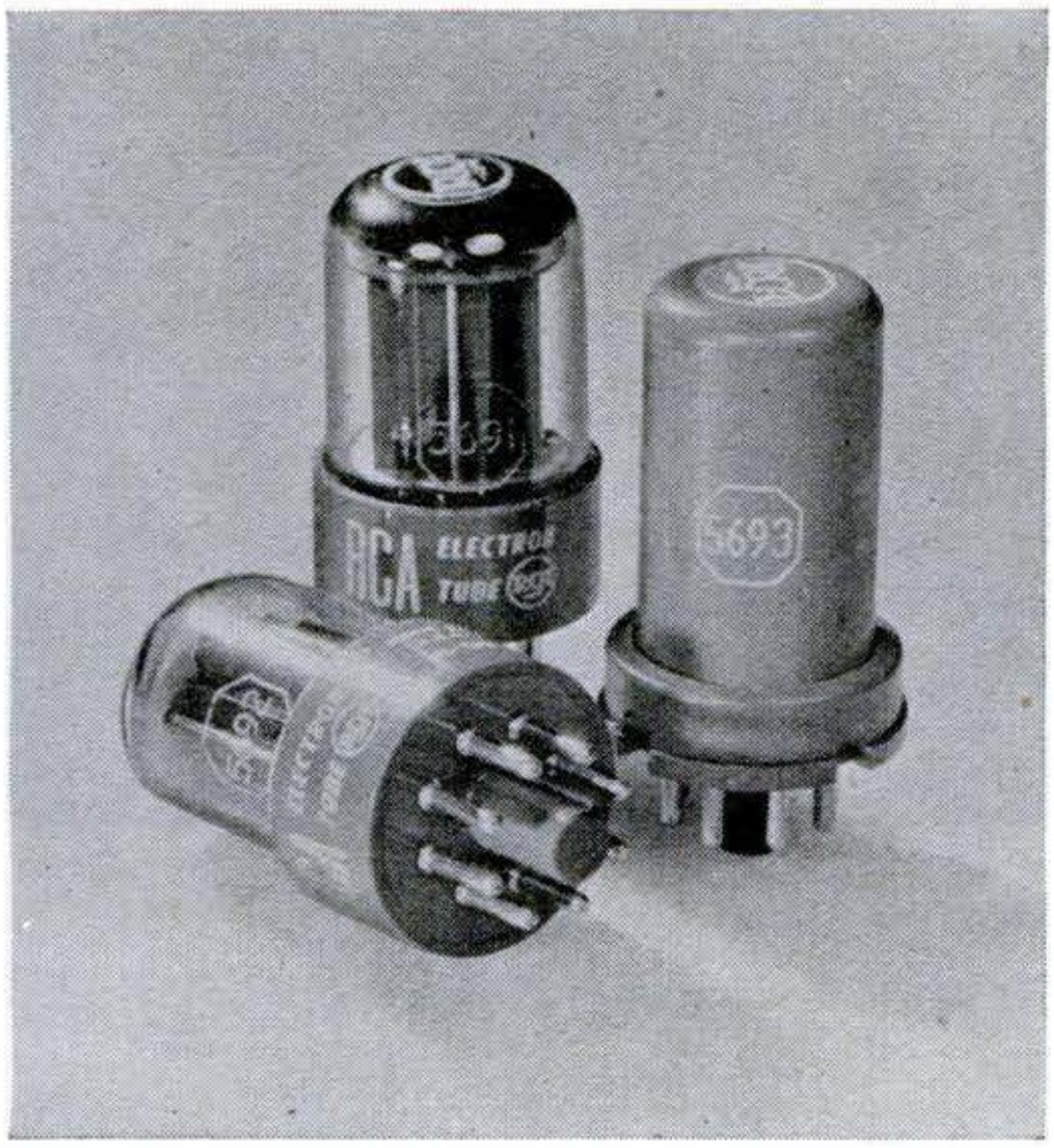
Applied right to the tube, this two-part lens focuses on the screen coating, not the glass front.

Felt Pads Increase Friction Between Records

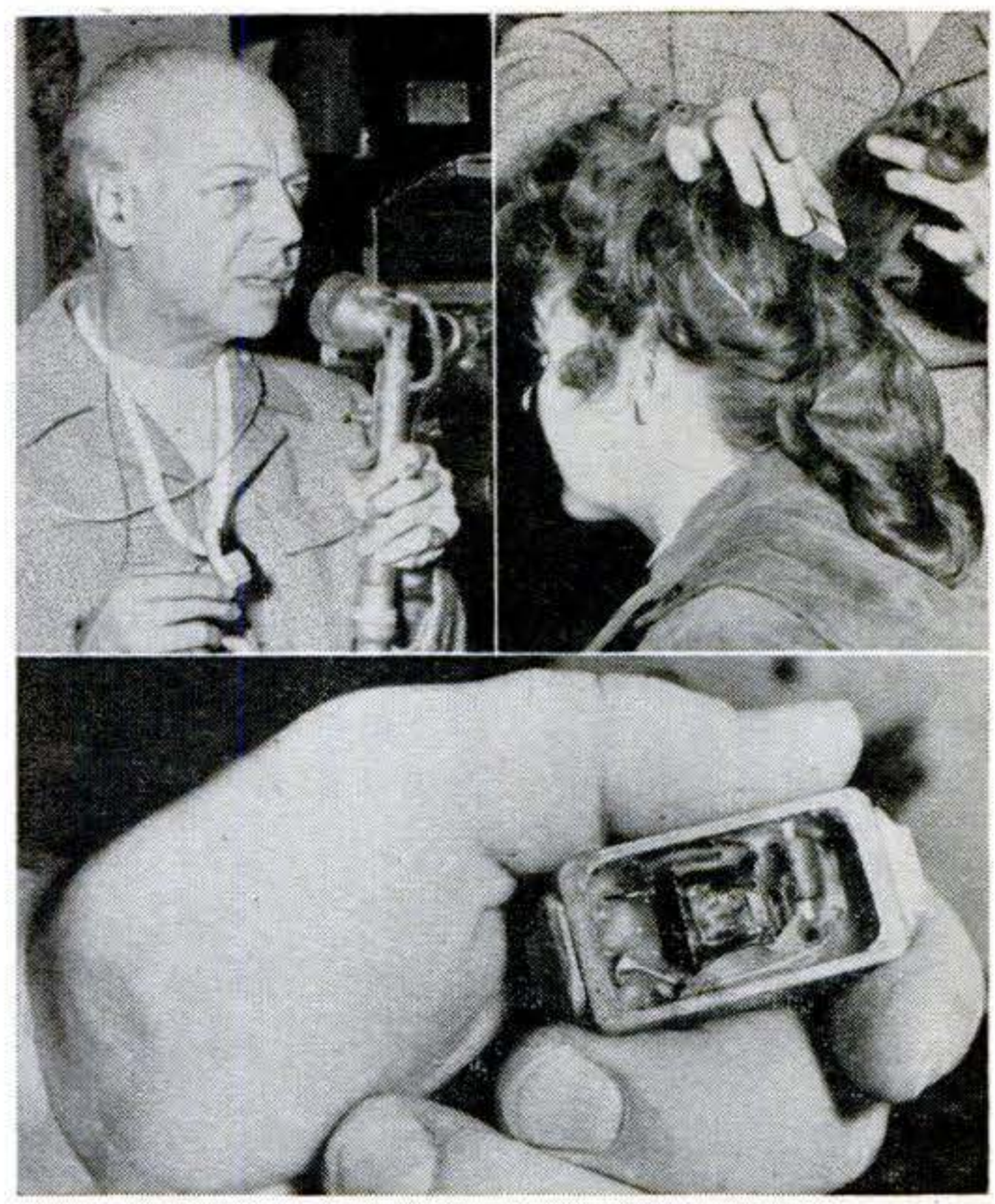
MUSICAL "wows"—sour notes caused by speed variations in records—sometimes come from slippage between warped records stacked up on an automatic changer. To correct this, friction disks manufactured by the Thomson Traction Mat Co., New York, may be affixed to the record labels. They're circular felt pads about 2¾″ in diameter, and are provided with cutouts so that the record title can still be read. Priced at about 20 for $1, the disks come with an adhesive coating for attachment.

Copyrighted material

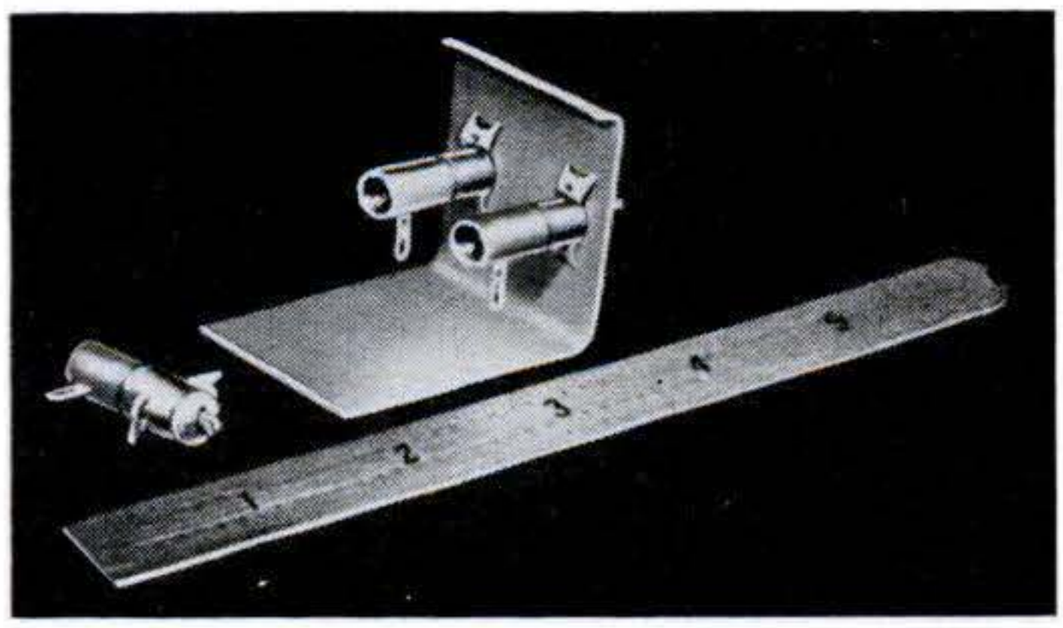
NEWS IN ELECTRONICS



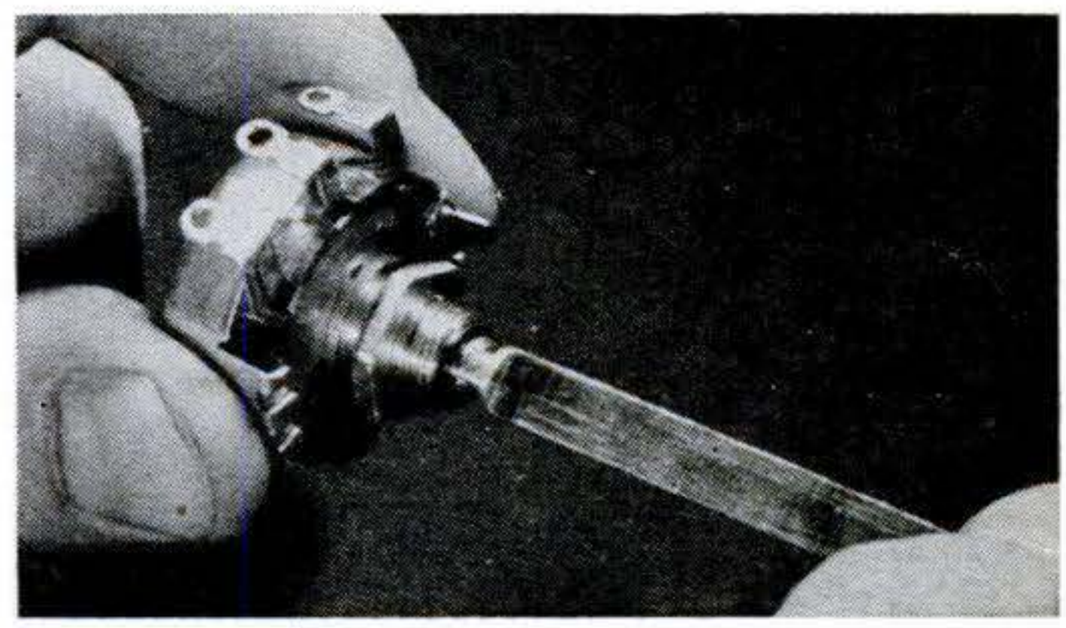
Red Tubes Give Extra Service. A new line of "Special Red Tubes" Ⓣ recently announced by RCA is intended for those electronic-tube applications where long life, ruggedness, dependability, and uniformity are of prime importance. First members of the series are types 5691, 5692, and 5693, roughly equivalent to the 6SL7, 6SN7, and 6SJ7 respectively. When used within specified ratings, these tubes are guaranteed for a minimum of 10,000 hours or two years of operation.



Director Radios His Orders. Tiny single-station receivers (directly above) have been built by sound technicians at Paramount Pictures to help movie actors and directors get together. A transmitter in the studio sends messages up to 300′, with the director speaking into a microphone instead of shouting into a megaphone. Director Mitchell Leisen, upper left, wears his set around his neck, but actress Andrea King has hers worked into her hairdo. The set is completely concealed, and a flesh-colored plastic tube carries the sound to an invisible hearing-aid phone in her ear.



Trimmers Tuned by Plungers. The capacity of these tubular trimmer condensers, manufactured by the Erie Resistor Corporation, Erie, Pa., can be varied by changing the position of the plunger inside the plastic tube. Relative slowness of capacity change facilitates accurate alignment. Range is 1 to 8 mmf.



Volume Control Has Clutch. The built-in clutch on this new Clarostat potentiometer allows it to be turned beyond normal end limits without damage to the shaft or contacts. Designed originally for the motor-driven controls on some television and auto sets, the unit is now available to experimenters.

Copyrighted material

How to Buy Radio Parts

By Frank Tobin

Knowing what to buy and why is the first step to successful shopping, and the key to building electronic gadgets that work.

SHOULD you ask a radio-parts salesman for a "double-o-one-mike condenser," he could put out a counterful of parts—all different, yet all .001-mfd. capacitors. "Which do you want?" he might ask. "Paper, mica, or ceramic—and what voltage and tolerance?"

If your first impulse is to say that it makes no difference so long as the capacity is right, you've probably never seen the wax melt out of a paper condenser used where a mica should have been. Sometimes, to be sure, identically rated parts may be used interchangeably. But don't overlook the many cases where an improper part may cause a short, burnout, or open circuit, or simply become defective in a hurry.

Some of the things that are worth knowing about condensers, coils, resistors, output transformers, and tubes are dealt with in this article. You may find them helpful next time you shop for radio parts.

Condensers—Fixed and Variable

Mica condensers (Fig. 1) are easily recognized by their molded-plastic cases. They are commonly used in by-pass and coupling circuits and as grid condensers in grid-leak detectors. Their working-voltage rating is generally about 500 volts DC but the cases are rarely marked. Mica condensers are used mostly at high frequencies, and therefore capacities are low, ranging from about 50 mmf. to 6,000 mmf. (.006 mfd.). You'll find micas in demand wherever low capacities with low loss at high frequencies are required.

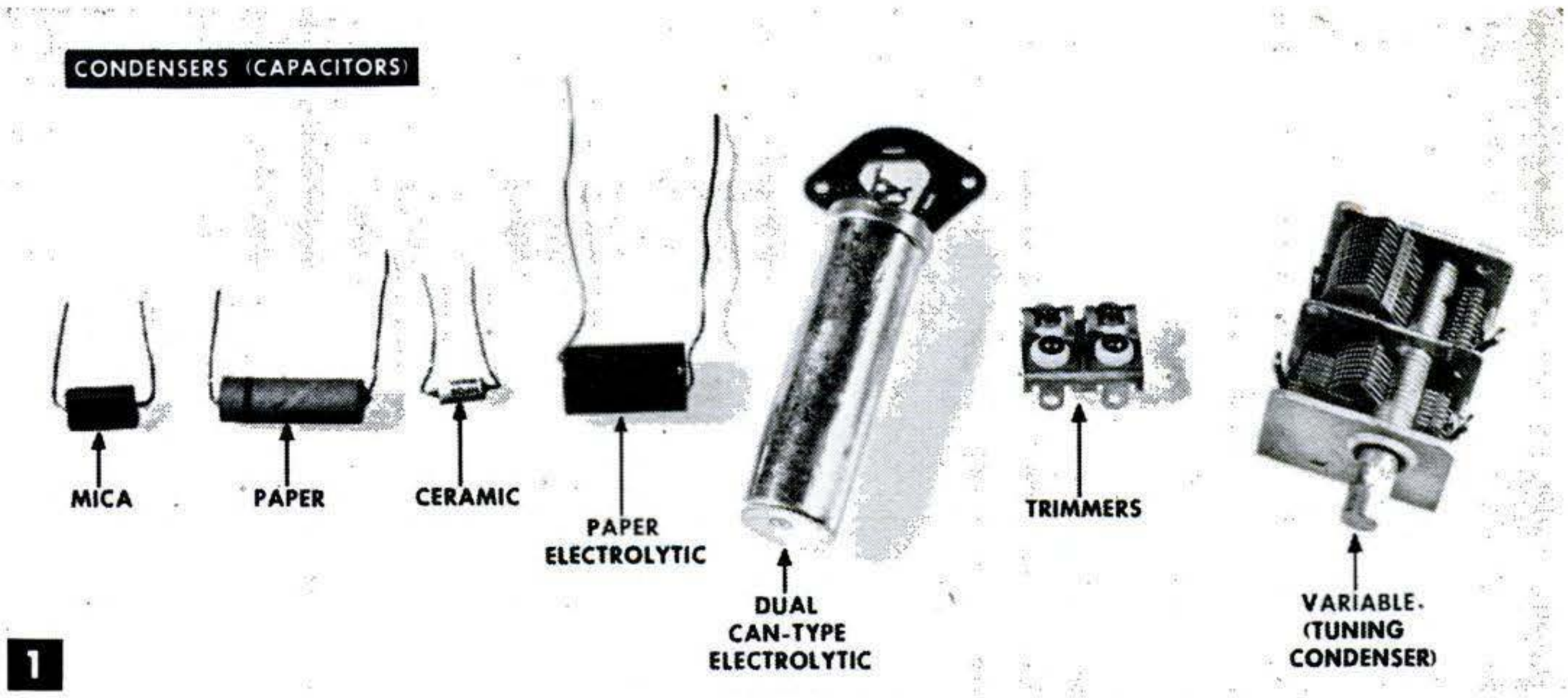
Incidentally, in case condenser arithmetic has you stumped, the basic unit of capacity is the *farad*. As radio components go, this unit is enormous, so it's divided by a million. This gives the *microfarad* (mfd.) and can be expressed as .000001 farad, (one millionth farad) but would normally be written 1 mfd. Even that's big in radio work, so the microfarad is further divided by a million to give the *micromicrofarad* (mmf.) which can be written .000001 mfd. or, more simply, 1 mmf. To translate mfd. to mmf., simply move the decimal six places to the right (in effect, multiply by a million). Thus .0001 mfd. is the same as 100 mmf., and .005 mfd. becomes 5000 mmf.

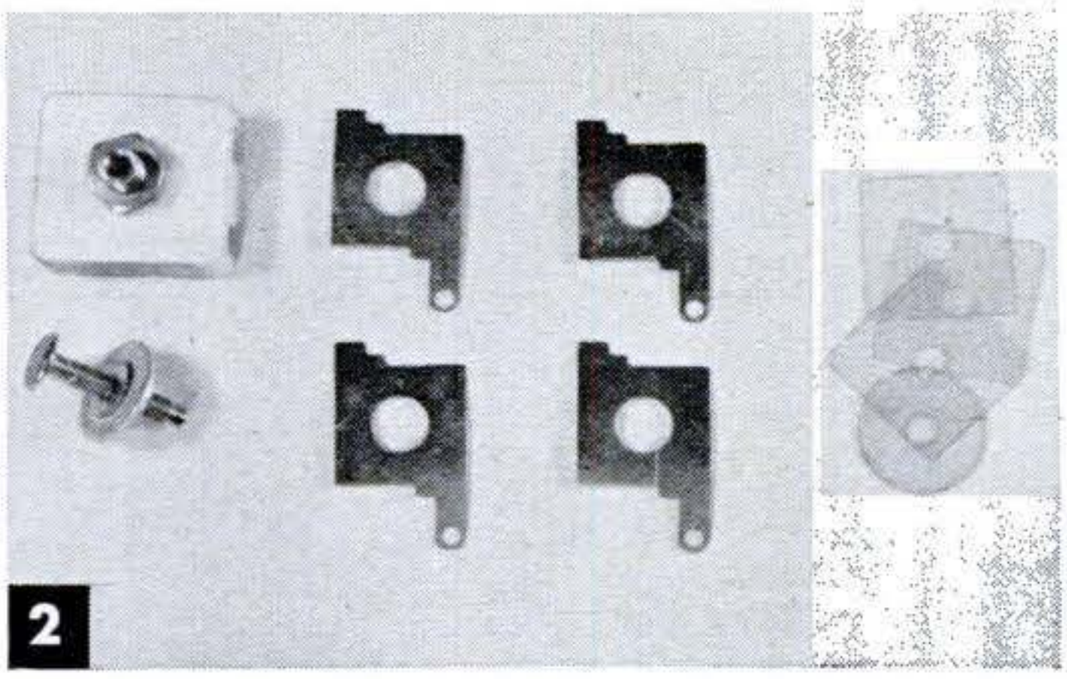
One of the war-developed ceramic capacitors will often do when specifications call for mica. Ceramics have high stability and compactness; they come in the form of small disks or tiny cylinders resembling fixed resistors (Fig. 1). They are also primarily for use in radio-frequency (RF) circuits.

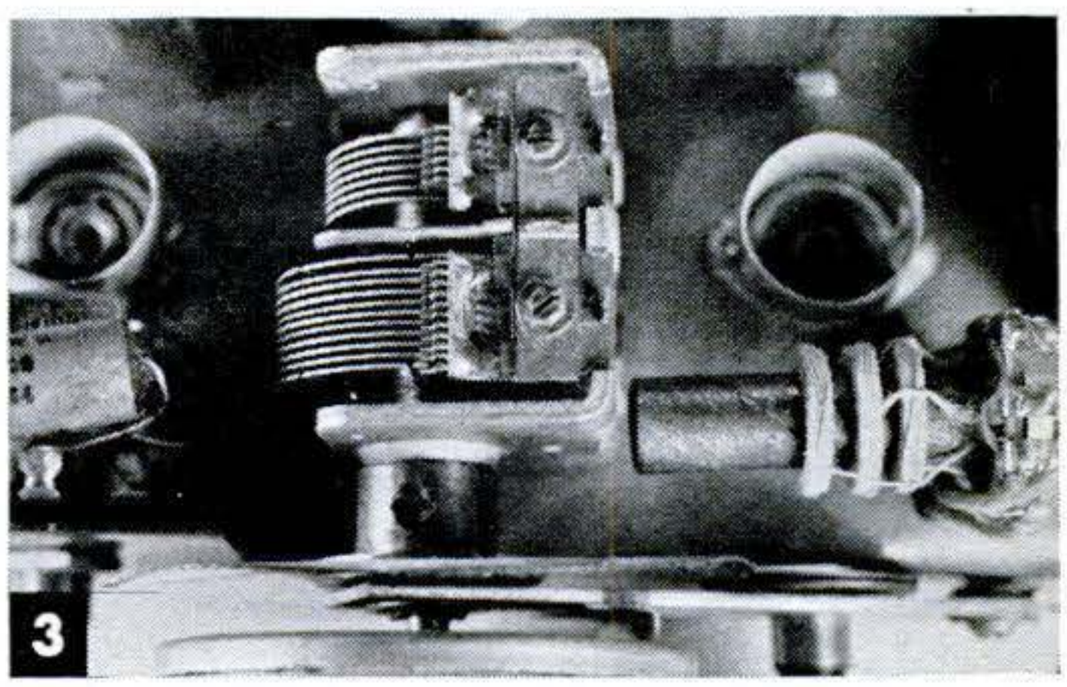
Paper condensers can be found in every stage of a modern receiver. They have such varied functions as by-passing stray signal voltages, coupling two stages, bass boosting (in tone-control circuits), and filtering in certain rectifier applications.

Working voltages are usually indicated for paper condensers, and it is important that the rating be adequate. When in doubt always take a larger voltage. In AC-DC or

Copyrighted material

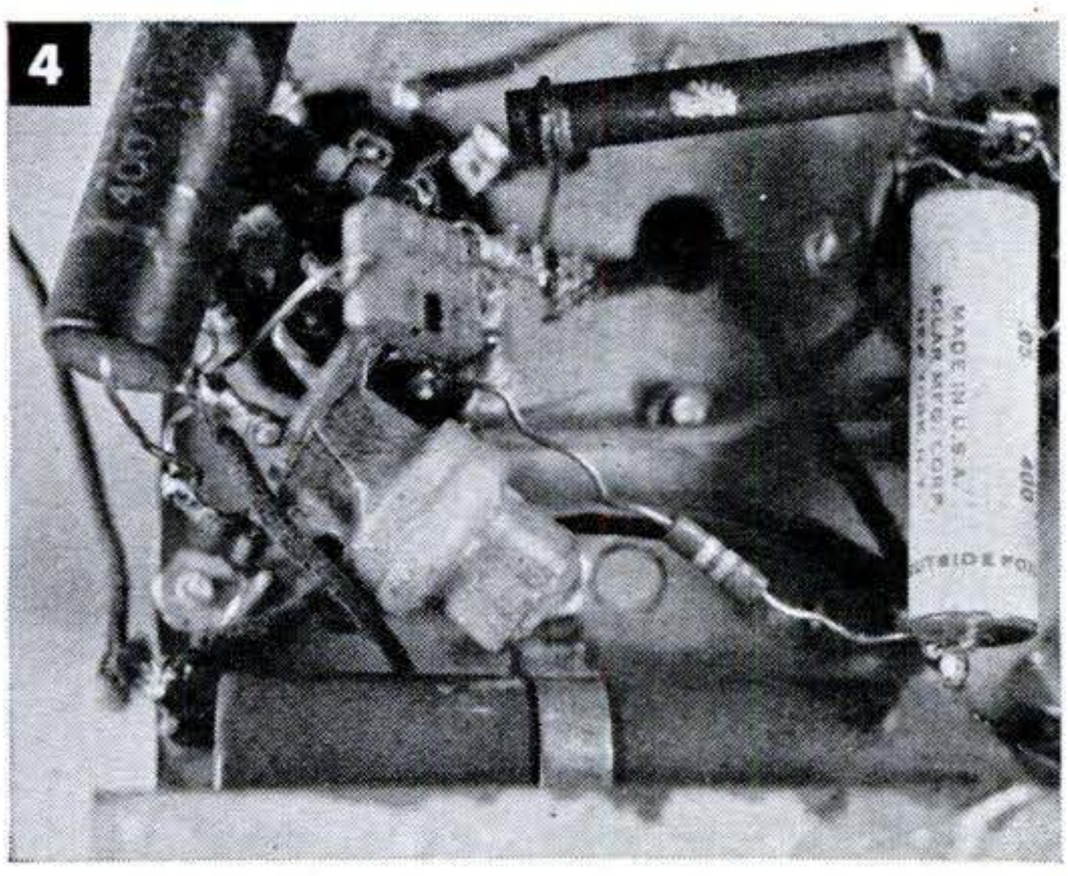


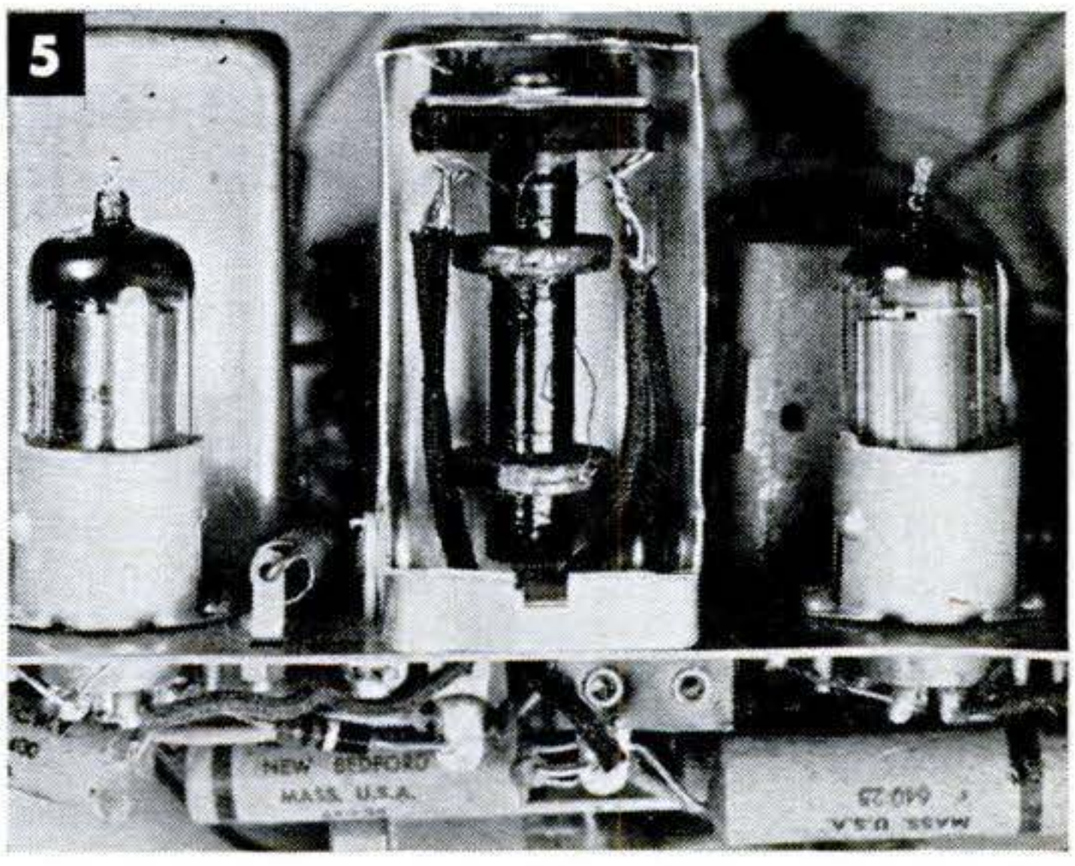




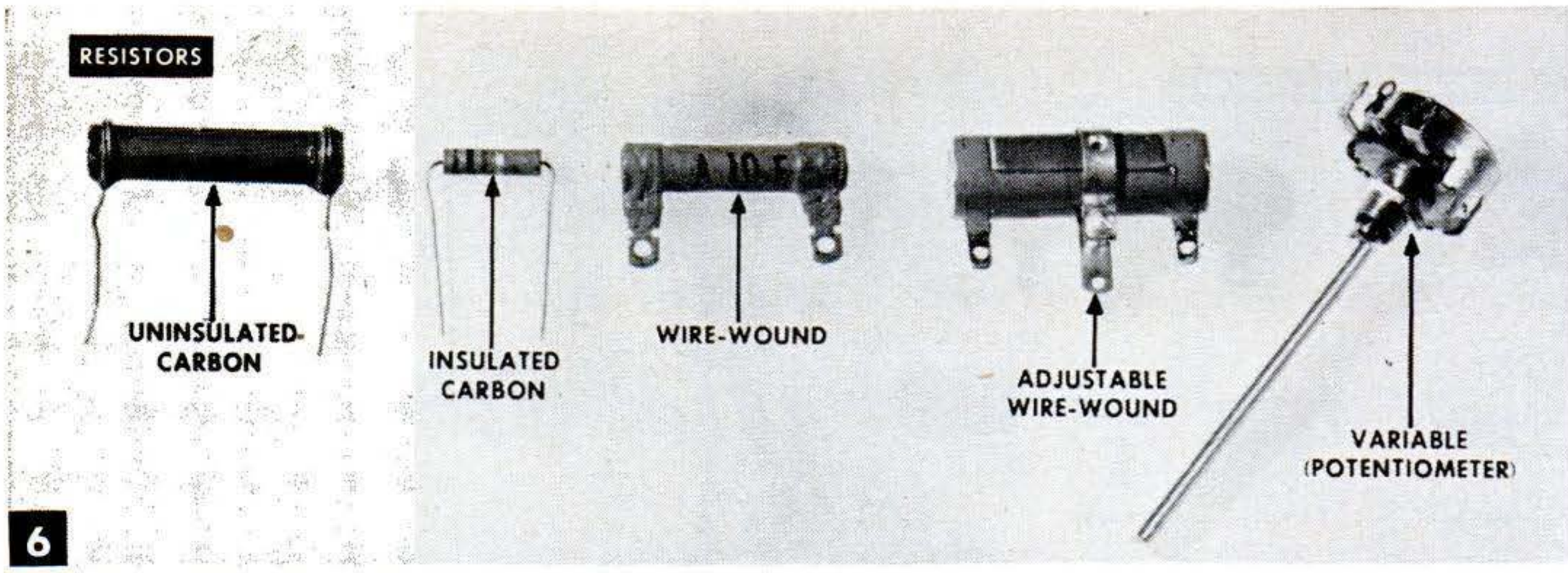
battery-operated receivers a condenser rated at 400 volts allows a safe margin. You might get by with these even in an AC set or amplifier that delivers 250 to 350 volts of B plus, but a few pennies more can buy greater safety in the form of 600-volt condensers. Sometimes heat generated by tubes may melt the wax in which a condenser is sealed. Where this seems likely, try to get capacitors sealed in plastic.

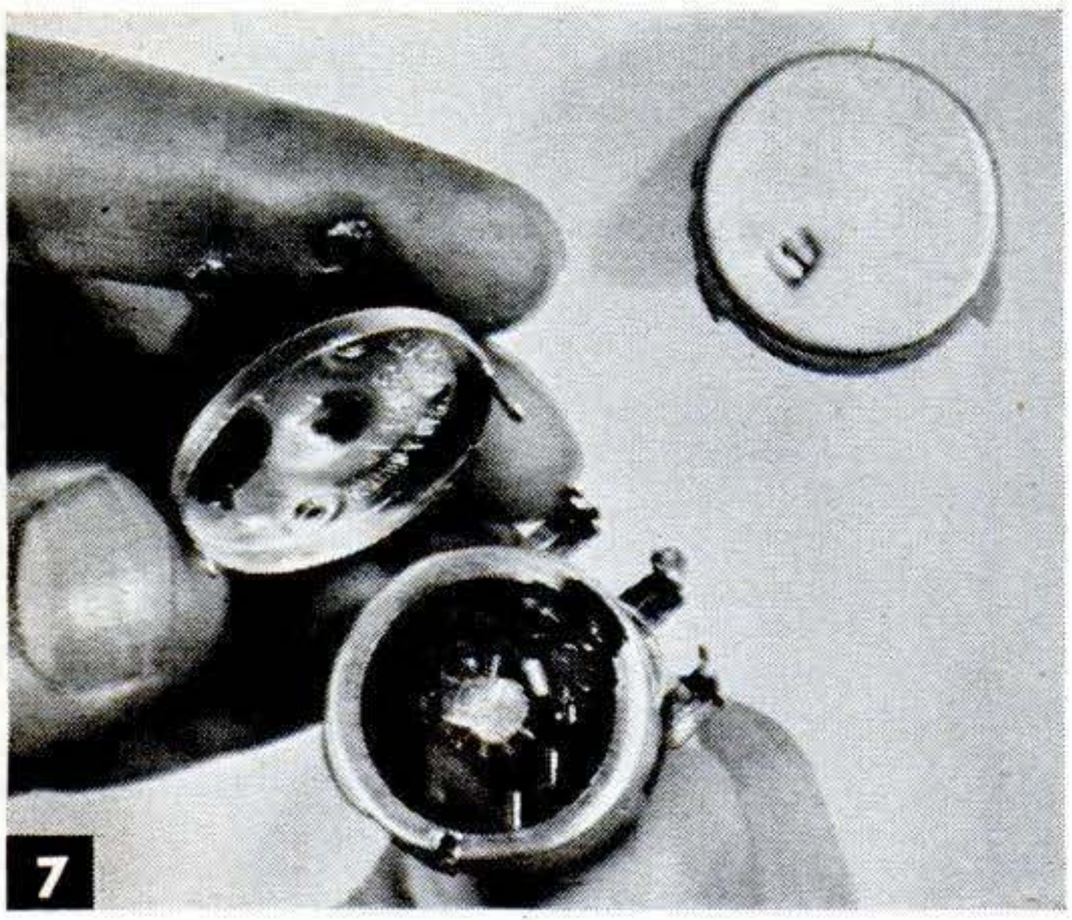
There is still another type of fixed condenser that crops up in practically every piece of radio or electronic equipment—the electrolytic. This is used in all filter circuits and in many special applications. Electrolytic condensers come in aluminum cans or cardboard containers. In order to save space (and cost), two or more units are often put in one container with separate leads brought out. A single can containing two units is called a dual electrolytic; multiple electrolytics with up to four sections are common. Polarity must be observed for electrolytics, so make sure the leads are color-coded or

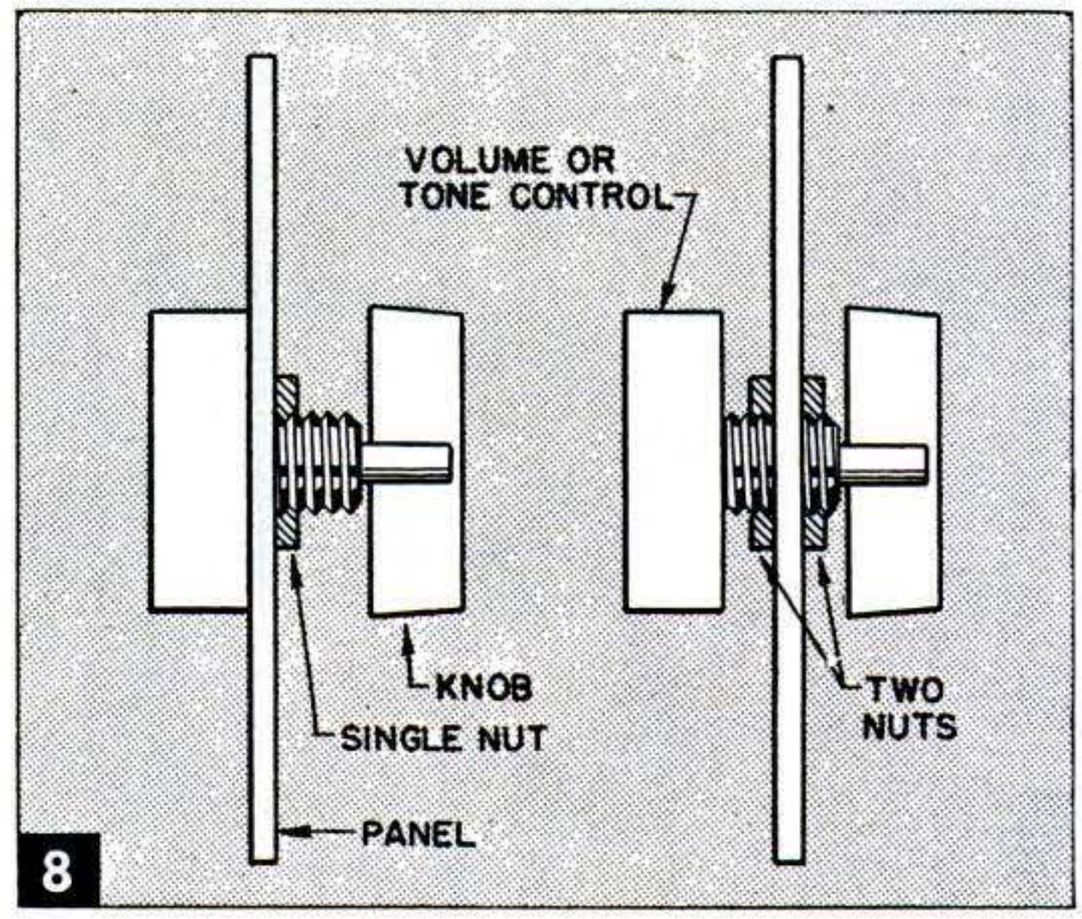




Copyrighted material







otherwise marked. Standard codes use red for the positive and black for the negative terminals.

Fixed condensers sometimes vary from rated value by as much as 20 percent plus or minus. Except for test equipment or the like you can usually allow an extra margin of up to 20 percent when you can't find a condenser of the right size. If the parts list calls for .005 mfd., you can get by with .006 or .004 mfd. But for very exacting equipment it is frequently wise to pay more for condensers guaranteed within 5 percent of stated capacity.

The variable condensers used for tuning short-wave or broadcast receivers are usually .00014 mfd. (140 mmf.) or .000365 mfd. (365 mmf.). They're available either as single units or ganged into two or three sections. The type to buy depends on the number of tuned circuits in the set. Ganging of two condensers of unequal size is common in superhets to tune the antenna and the oscillator circuits to different frequencies.

Experimenters almost always find it wise to purchase variable condensers with built-in trimmers. These are sandwiches of metal and mica (Fig. 2). A setscrew squeezes the metal plates more tightly when you have to increase capacity, or relieves the pressure to reduce capacity. Fig. 3 shows trimmers mounted directly above the variable plates.

Trimmers are built into most IF transformers to enable you to make minor adjustments. They also come separately for use in coupling an antenna to an antenna coil, as padders in oscillator circuits, and even as tuning condensers in midget receivers.

Coils

Coils constitute another large and often bewildering category to the man who sets out to buy radio parts. Under this head you will find plug-in, antenna, RF, oscillator, and IF transformer coils. Some are shielded, some aren't.

Plug-in coils, found in simple crystal and regenerative receivers, are generally sold in matched sets to cover broadcast and short-wave bands. In most cases the tuning condenser is of 140-mmf. capacity. Four-prong coils are used when the circuit calls for two windings, while six-prong coils are needed for three windings.

Copyrighted material

Antenna and RF coils are employed in small TRF receivers. They are available either shielded or unshielded. When using unshielded coils, it is best to mount the antenna coil above the chassis and the RF coil underneath so the chassis will serve as a shield. Wherever it is necessary to mount all coils on one side of the chassis, or where there's more than one tuned RF stage, only shielded units should be used. In buying receiver coils, ask for a matched set. This will assure accurate ganging between coils as well as with the condensers.

Most superheterodyne circuits call for an antenna coil, and they always require an oscillator coil, and at least two intermediate-frequency (IF) transformers. Shielding problems are the same as in the TRF set. In the lower foreground of Fig. 4 an unshielded oscillator coil is mounted underneath the chassis.

The transformers used to couple IF stages are basically coils tuned to a fixed frequency —in broadcast receivers 456 kc. They are in aluminum cans (Fig. 5 shows one cut away) with lugs, clips, or feet by which they can be mounted.

Some IF transformers are brought to peak frequency by trimmers, and some by adjusting an iron core. The latter respond over a much broader tuning range and are therefore easier to align without a signal generator.

One final point to bear in mind when buying coils: If you are building a receiver with only a single stage of RF or IF, you need maximum amplification in each stage. You will get this plus greater selectivity by using coils with iron cores.

Fixed and Variable Resistors

You'd have to look hard for an electronic circuit that doesn't use a fixed or variable resistor of some kind. Fixed carbon resistors constitute the bulk of all resistance units. They are inexpensive, reasonably accurate, and come in a large variety of sizes and ratings. Some are encased in plastic, which makes them impervious to moisture and less likely to short against other components. Uninsulated resistors (Fig. 6) dissipate heat a little more readily but shouldn't be used in cramped quarters.

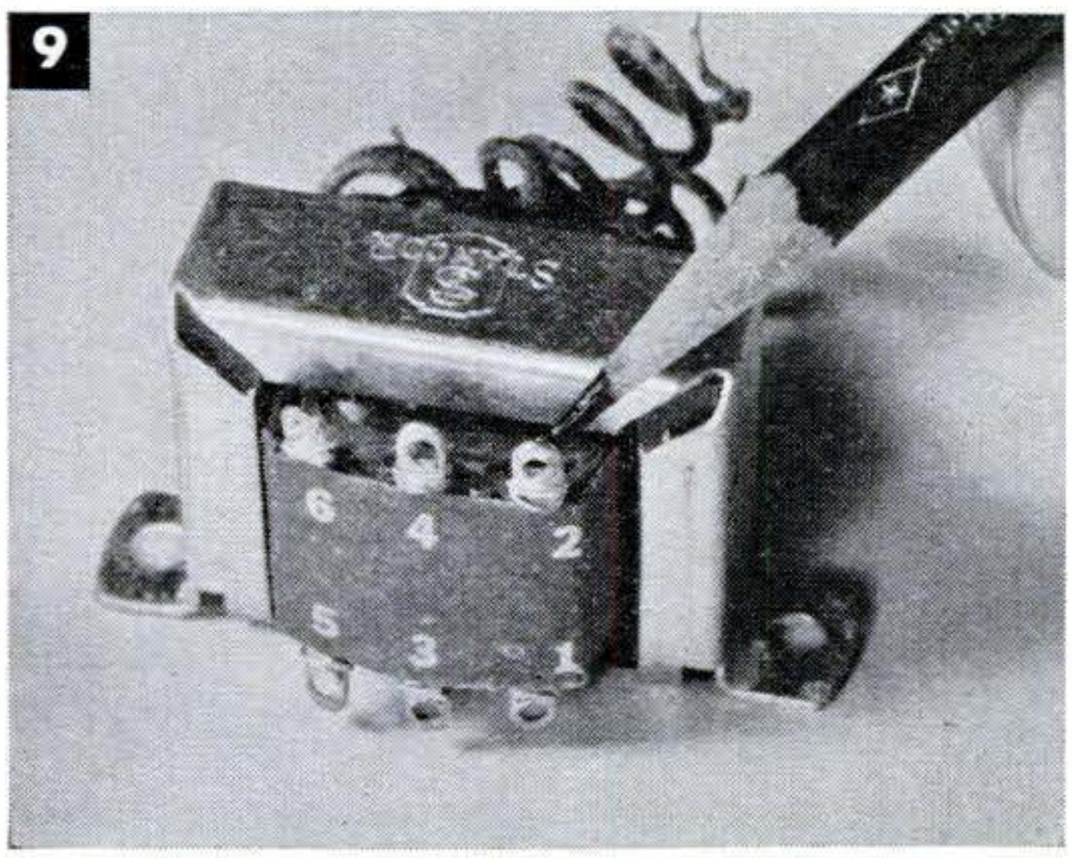
All fixed resistors are rated in *ohms* (the unit of resistance) and *watts* (current rating). As with voltage ratings in condensers, a larger wattage is safer when there's doubt.

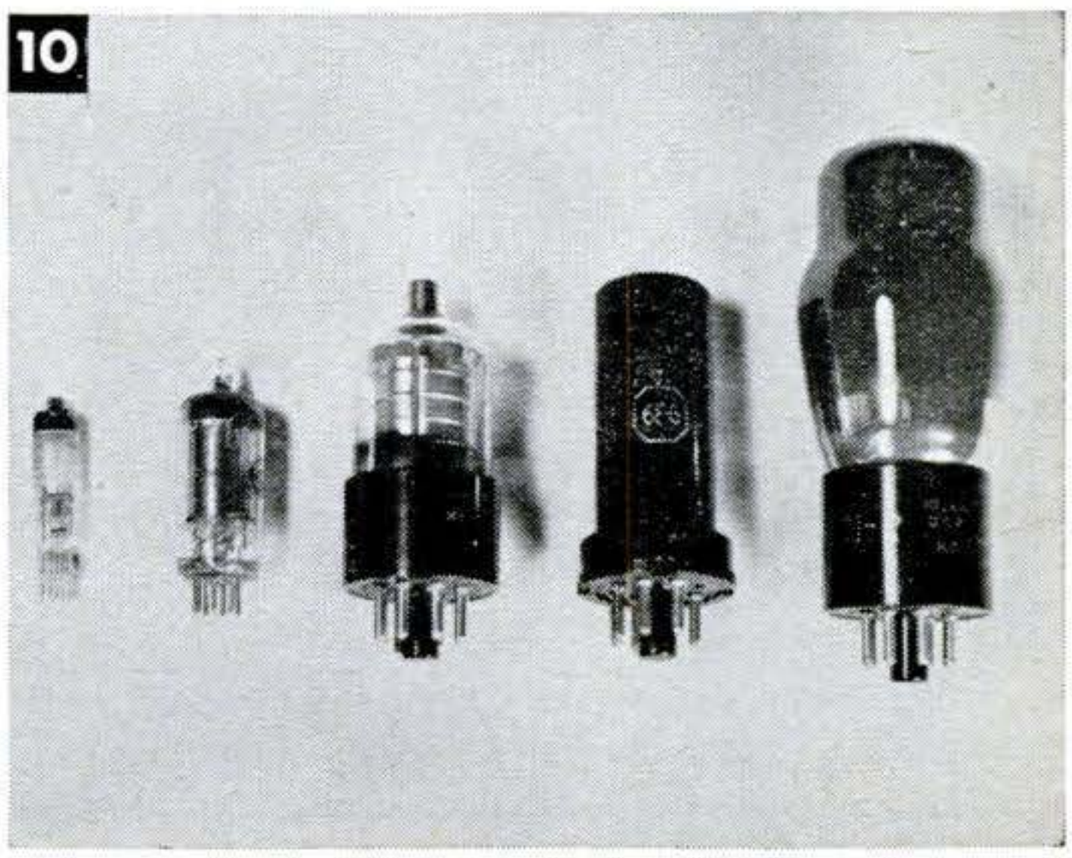
For AC-DC receivers and amplifiers, ½-watt units are generally adequate in the control-grid circuits of amplifier tubes. Plate and screen circuits should get 1-watt resistors, and cathode and filter circuits 2 watts or more. Battery-operated equipment can generally get by with ratings half as large.

Wire-wound resistors are employed where current drain is high and where stability and accuracy are paramount. On adjustable wire-wound resistors part of the winding is left bare so that a movable metal band can tap off any resistance between zero and the maximum.

Variable resistors, now found chiefly in the form of potentiometers, have a fixed carbon or wire-wound element and a moving contact turned by a shaft. If you want resistance to increase evenly in proportion to shaft movement, specify a linear-taper pot. Because of tube characteristics, nonlinear pots usually give more gradual control over volume, tone, and bias. In logarithmic pots, usually used for tone and volume controls, resistance increases at a definite but uneven rate. In end-tapered pots, used for varying tube bias, resistance "thins out" at one end.

For the convenience of radio builders, the





Copyrighted material

makers of potentiometers provide switches that can be slipped onto the back of the unit (Fig. 7). The switch is actuated by the first few degrees of shaft turn.

A potentiometer is usually fastened to a panel by means of a gripping nut screwed on a threaded shaft. Since there is a good deal of variation in shaft nuts, you can often do yourself a favor by purchasing an extra one at the time you buy the potentiometer. With two nuts you can exactly regulate the projection of the shaft in front of the panel as shown in Fig. 8.

Output Transformers

In purchasing an output transformer for a small set, it is best to look for the universal type. Taps on the secondary winding of the transformer (Fig. 9) allow matching of any tube impedance from 1,500 to 20,000 ohms to any voice-coil impedance from .1 to 24 ohms. These figures vary somewhat with different makes.

Impedance matching is probably the leading consideration in the selection of an output transformer, but there is one other that must never be overlooked. If the transformer can't handle all the plate current that will be delivered to it, it cannot transfer that power to the speaker. Output transformers are rated in watts. For most battery and small AC-DC receivers, 4 to 5 watts is suitable; for AC receivers and high-powered audio amplifiers you will usually want a transformer rated at 8 watts or more.

Tubes and Pilot Lights

Some people feel that radio tubes offer the largest variety of radio components. Several catalogs list upward of 400 types. This, however, need rarely worry the builder who works from a parts list. The specifications always designate tubes by numbers.

One puzzling element is the lettering that follows the tube number. A metal 6K7, for example, has the same electrical characteristics as the glass-dome 6K7-G or the bantam 6K7-GT (the latter is sometimes listed as GT/G). The only differences are in their physical dimensions (Fig. 10) and in the method of shielding. The first of these tubes is encased in metal, the other two in glass envelopes of different sizes (G being considerably larger than the GT). The 6K7 requires no separate shielding, while the others must be covered with a metal shield (Fig. 11) to suppress undesirable coupling. Only tubes used in the high-frequency circuits—RF, converter, IF, and sometimes detector stages—need shielding; others such as power output tubes and rectifiers don't require it. Fig. 10 shows the most common types of receiving tubes, being, from left to right, subminiature, miniature, bantam (GT), metal, and glass dome (G).

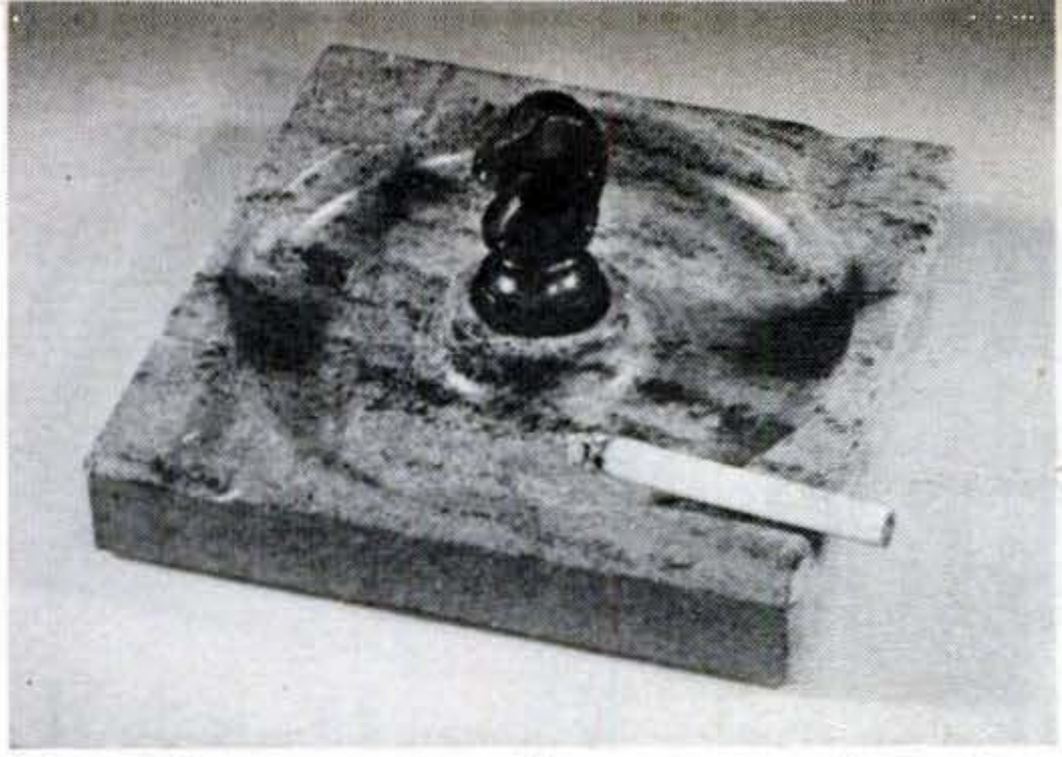
Sometimes you want to duplicate a particular circuit in a smaller size. This is becoming increasingly possible with miniature components. For example, the 50L6 beam-power amplifier can be replaced with a 50B5 miniature.

Dial pilot bulbs become critical in AC-DC sets, because they're in series with the tubes and must match them in current rating, since current is equal in all parts of a series circuit. The bulb ratings are marked by a colored glass bead in the bulb. For example, a set using tubes with heaters drawing .15 amp at 6.3 volts calls for a brown-bead pilot bulb. A white bead means .5 amp. at 2.5 volts, a blue .3 amp. at 6 to 8 volts, and a pink one .06 amp. at 2 volts. All types come with both bayonet and screw bases to suit the two socket types (Fig. 12). END

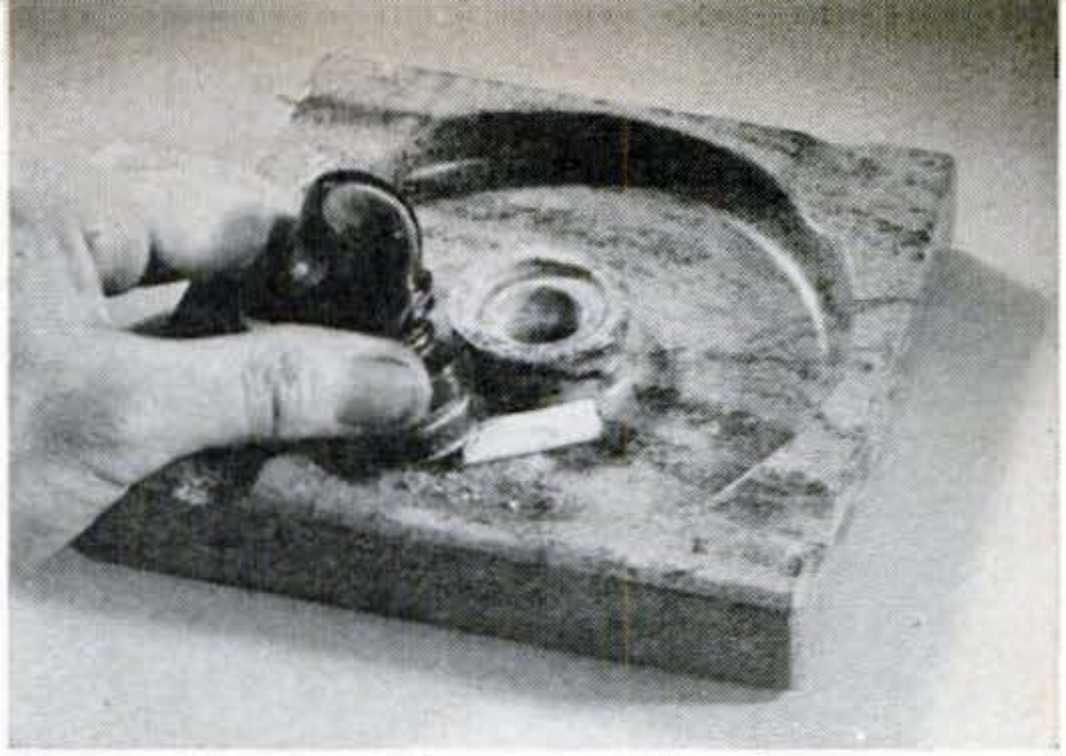
11

12

Copyrighted material



Meant for men, this ashtray is a good smoking companion, doesn't call for frequent emptying.



Steatite base can be turned by gluing to wood with cellulose cement for faceplate mounting.

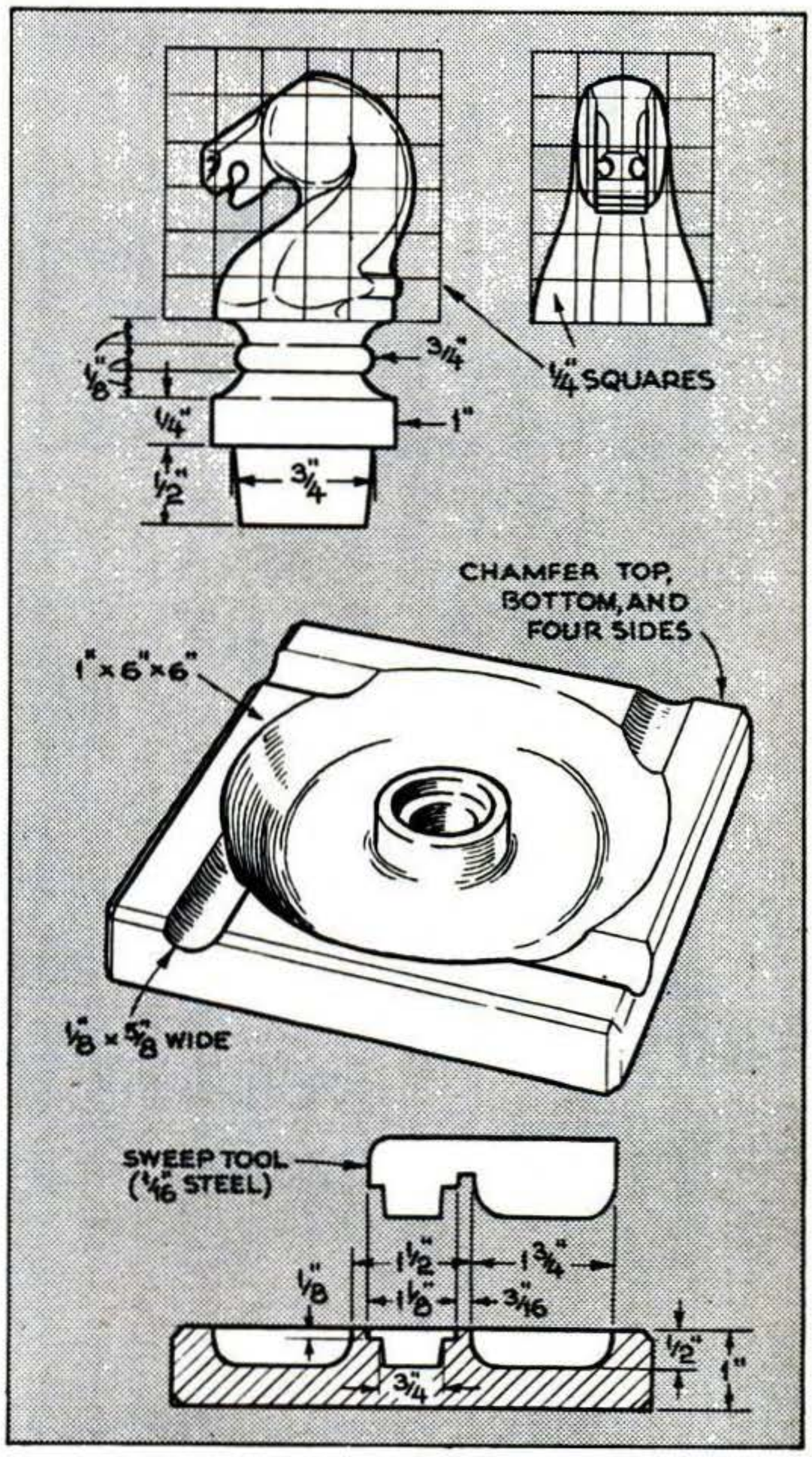
Ashtray Figure Snuffs Out Butts

If you don't like light, undersized ashtrays, make yourself this man-sized one. Massive enough to stay where you want it, it has a big capacity. The figure, borrowed from the traditional chess knight, can be taken from its socket to crush smoldering butts.

The original shown was made of Sculpstone Ⓣ, a form of steatite sold for craftwork. It's pleasingly heavy, available in various colors, and so soft it can be worked with hand tools. You could, of course, cast the project of Keene cement, model it in clay and fire it, or make the base of wood with a metal liner, and the figure of plastic.

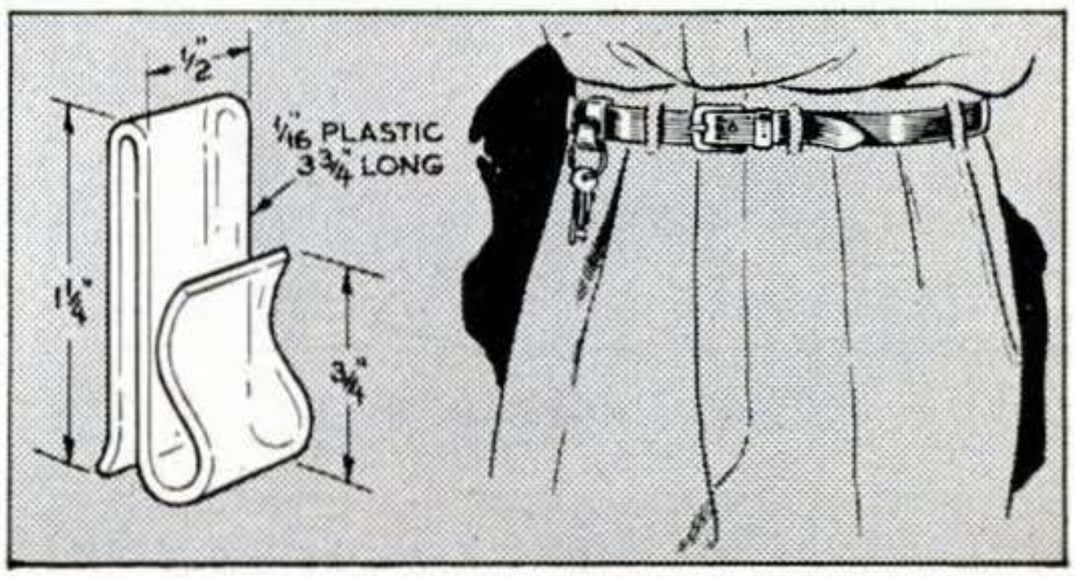
To make it of Sculpstone, bore a ⅝″ hole in the center of the base. With a knife or scraper, taper this to ¾″. File a sweep tool as shown and work it around from the center hole to form the concave recess. File the cigarette rests, chamfer the edges, smooth with fine steel wool, and apply oil to bring out the tone.

The base of the figure can be turned, or shaped by round carving. Transfer the head pattern to two sides of the block, saw to outline, and carve. The stone can be coated with a plastic hardener to resist abrasion.



Key-Ring Clip Bent of Plastic

Handsome but not conspicuous, this key-ring holder slips on your belt and has a secure hook for the ring. Polish the cut edges of a 3¾″ strip of 1/16″ sheet plastic, heat until soft, and shape with gloved hands. If you have a strip heater, warm ⅛″ for the close bend and a 1″ section for the hook.—*Frank Shore, Manhattan, N. Y.*



Copyrighted material

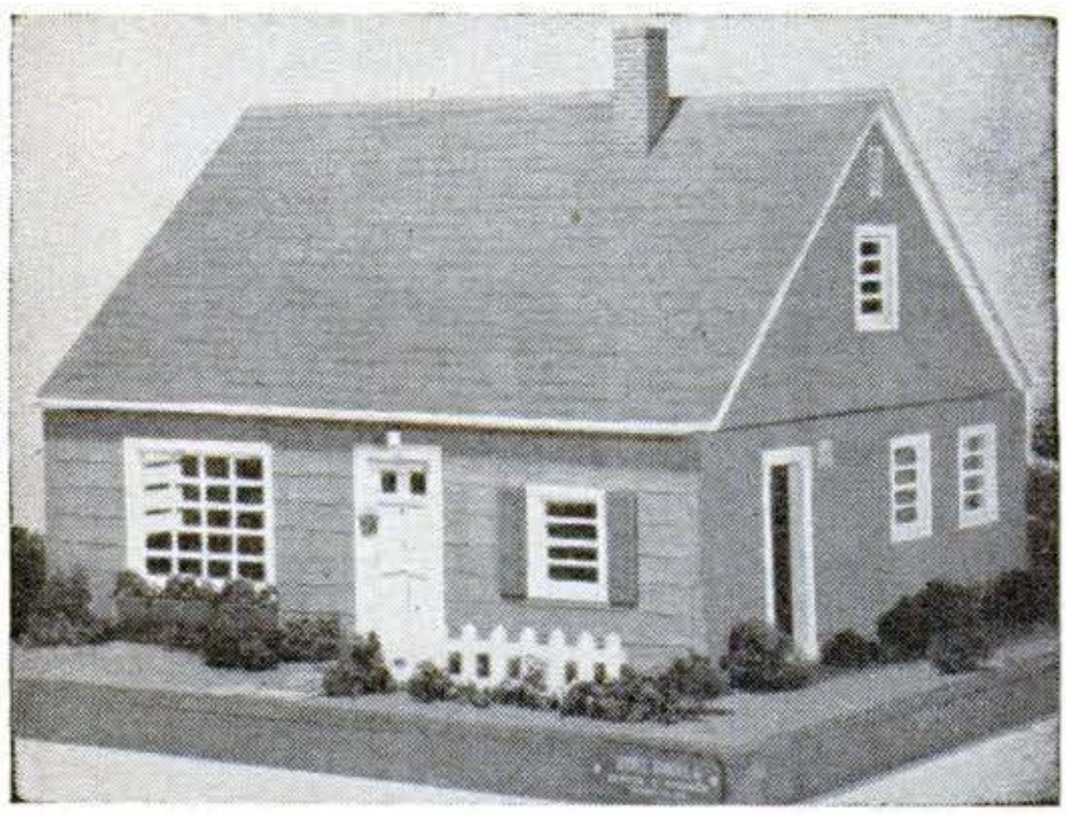
Miniature Models Rival Real Houses for Detail

Chief tools are pencil, straightedge, knife, paintbrush. Above, Gardner assembles a wall.

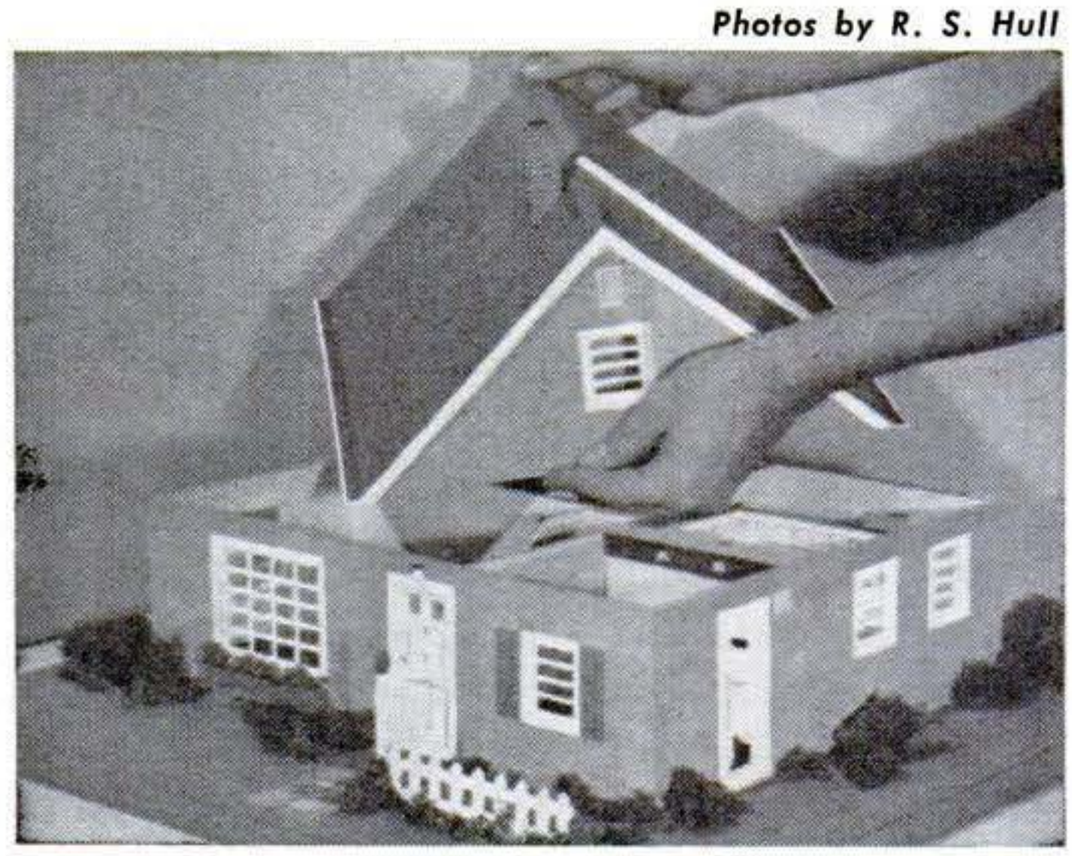
HERE'S an example of a hobby that grew into a profitable spare-time business. Long interested in architecture and model-making, George S. Gardner, of Lynbrook, N. Y., found many architects and builders anxious to buy exact scale models of the homes they planned to erect.

His models are made of illustration board, wood being used only for inside bracing and occasionally for a chimney. Such effects as clapboards, brick, and field stone are achieved by painting with poster colors.

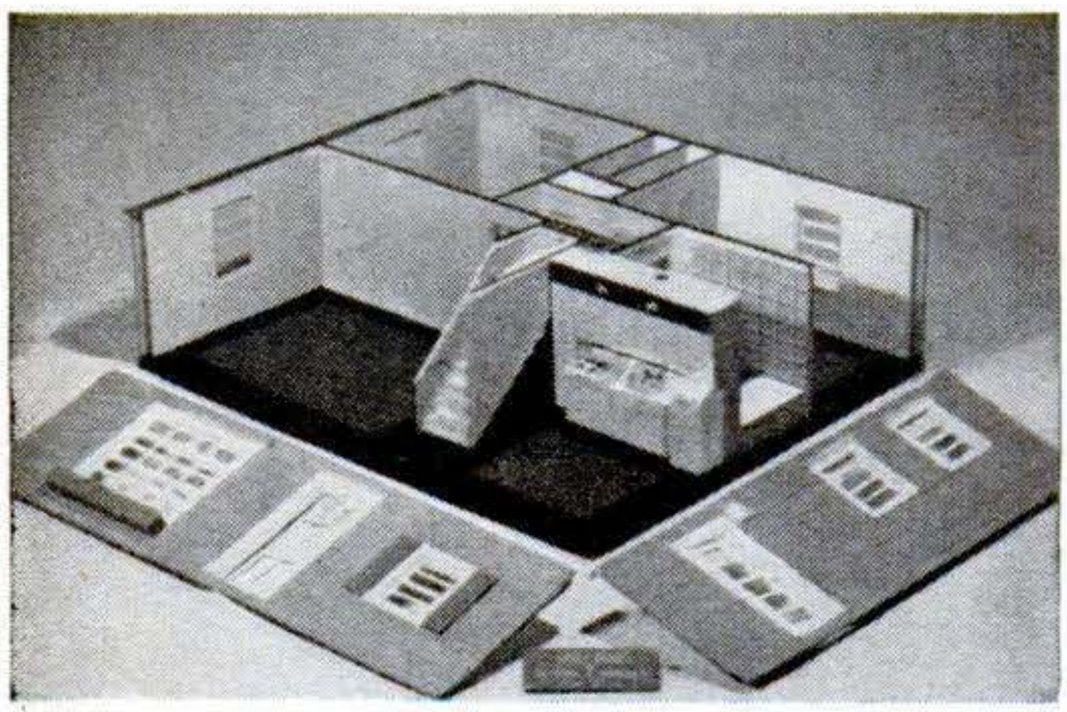
Photos by R. S. Hull



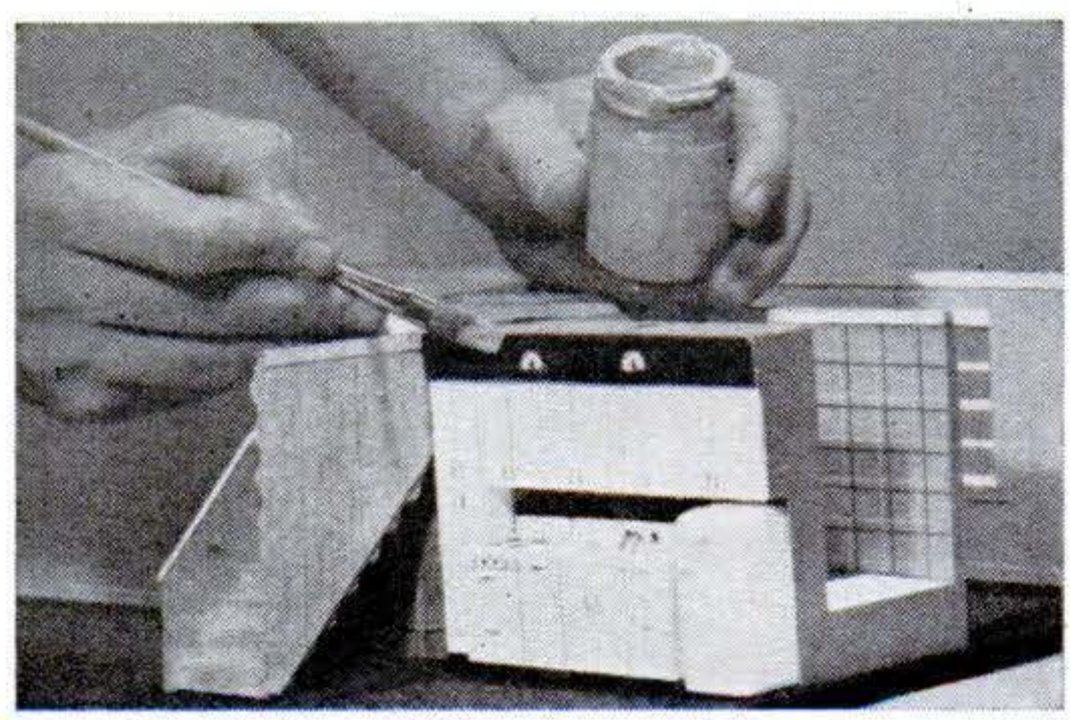
A scale of ½″ to 1′ was used for this model. Overlapping strips of paper simulate siding.



The roof lifts off so prospective buyers can see the layout of rooms and interior fittings.



Each wall is made as a unit, complete down to paint, and the whole then cemented together.



Hand painting with poster colors gives varied effects. This paint is flat and dries quickly.

Copyrighted material

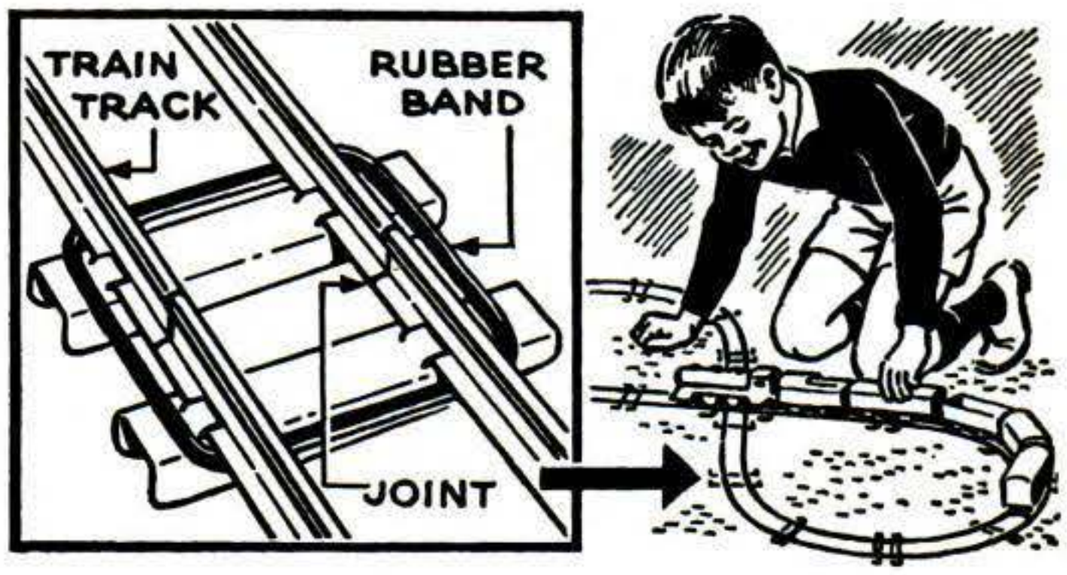
Relative size of this trim model is shown by the cigarettes. The scale here was ⅛″ to 1′.

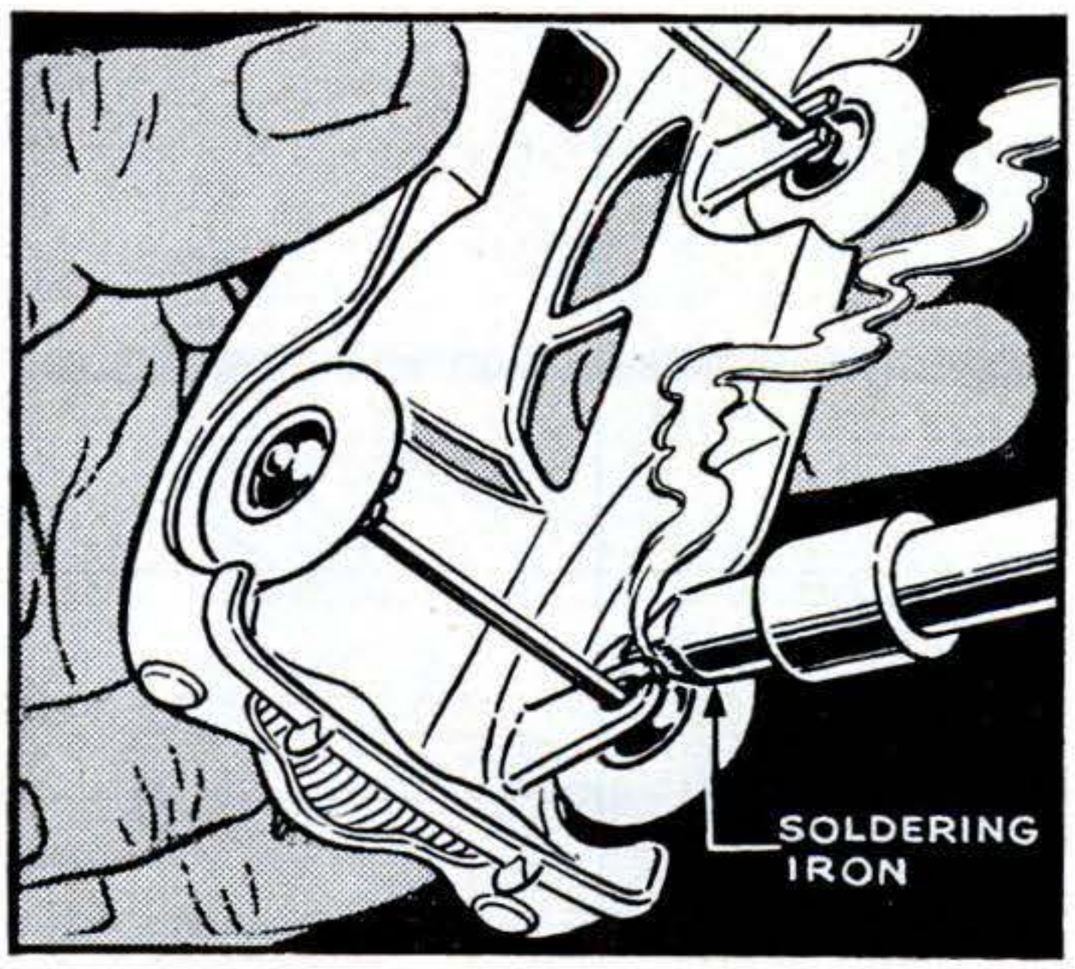
Many builders use models of this kind to show clients what the completed job will look like.

Finished models are mounted on a green board, walks and drives are added, and the plot landscaped with green sponge rubber, cut up in a meat grinder and tipped with bright colors in spots to simulate flowers. Norwegian moss dyed green is employed for shrubs and trees. Interior fittings like refrigerators and bathtubs are cast of plaster.

Rubber Bands Hold Toy Track

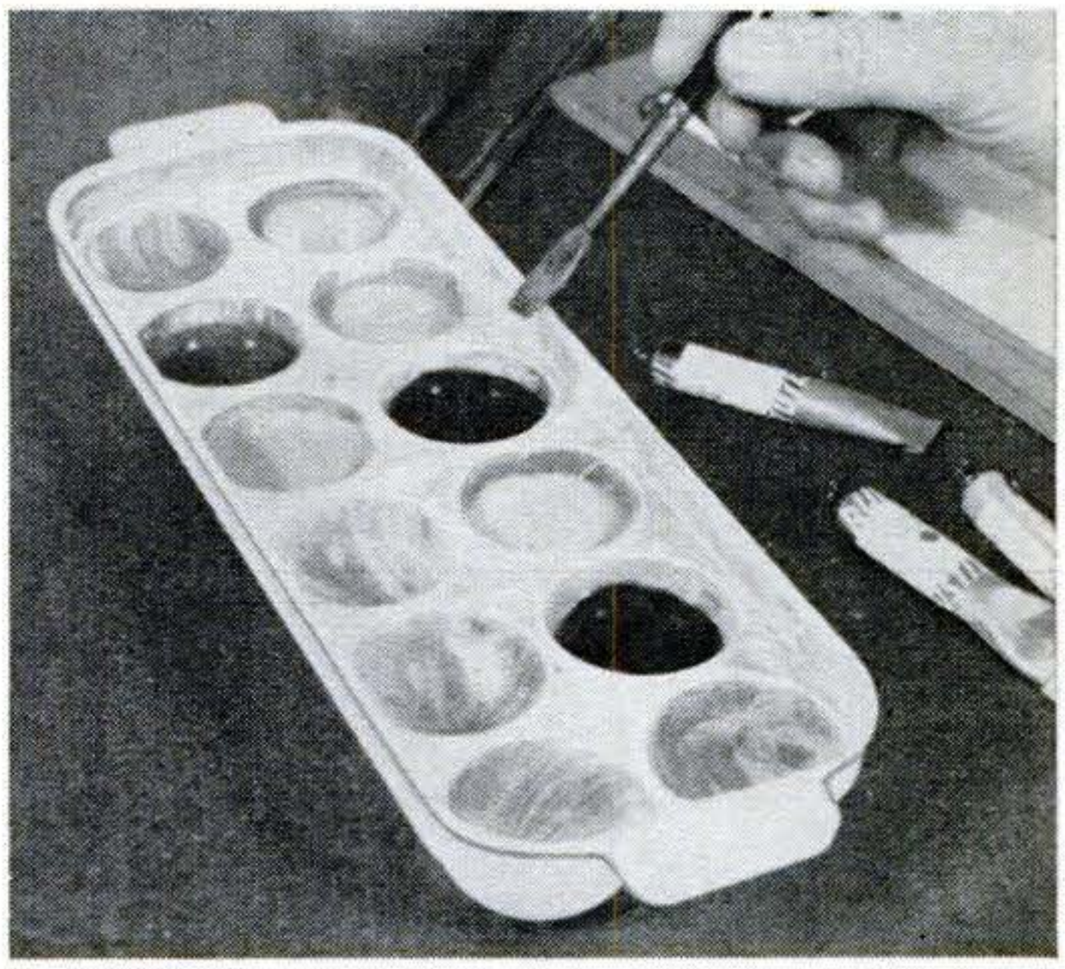
If the sections of track for a toy train develop a tendency to pull apart, a rubber band looped over the ties and under the rails at each joint will provide a quick and simple remedy. As seen in the drawing, the rubber band does not interfere with the train or raise the track from the floor, and there is nothing to come loose or rattle.





Heat Repairs Plastic Toys

In some of the toy automobiles and other wheeled vehicles made largely of plastic, the axles frequently pull out of their notches under the toy. This can be prevented by heating the tips of the axle housing with a hot soldering iron and bending them together, sealing in the axle.—*R. M. Woodbury, Atkinson, N. H.*



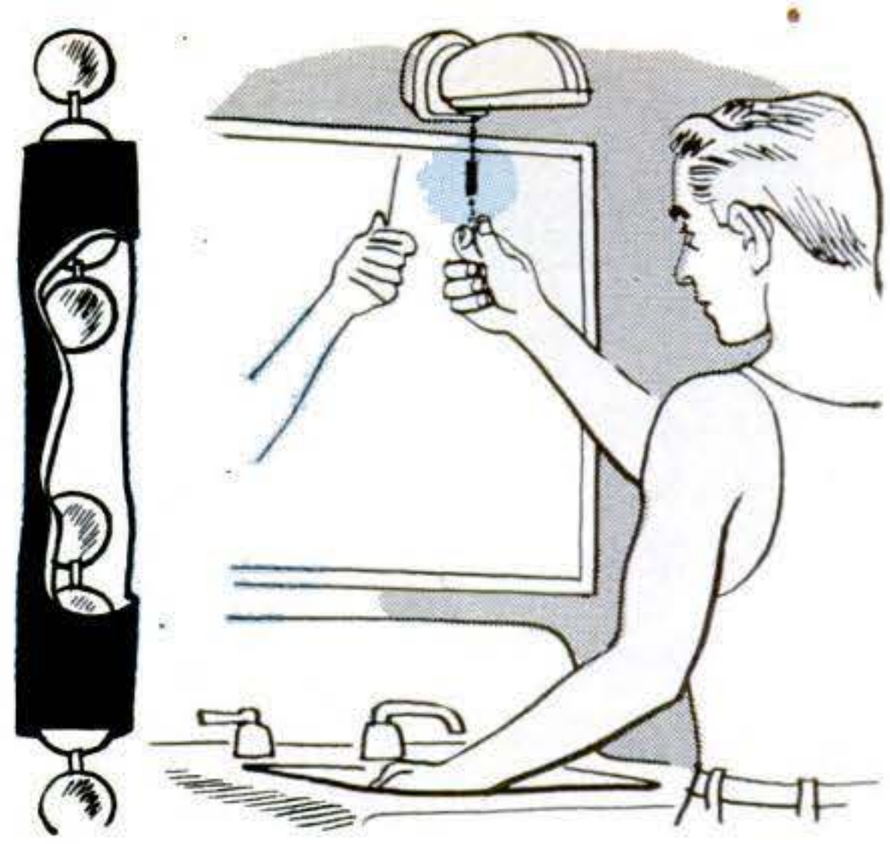
Paints Mixed in Egg Carton

One of the new plastic egg cartons provides an efficient means of mixing water colors. The pockets are deep enough so you can prepare paint for an extensive job, and the container is easily cleaned after use. With various colors right at hand, the carton is especially useful for sketching outdoors.—*Will Stoll, Elmhurst, Ill.*

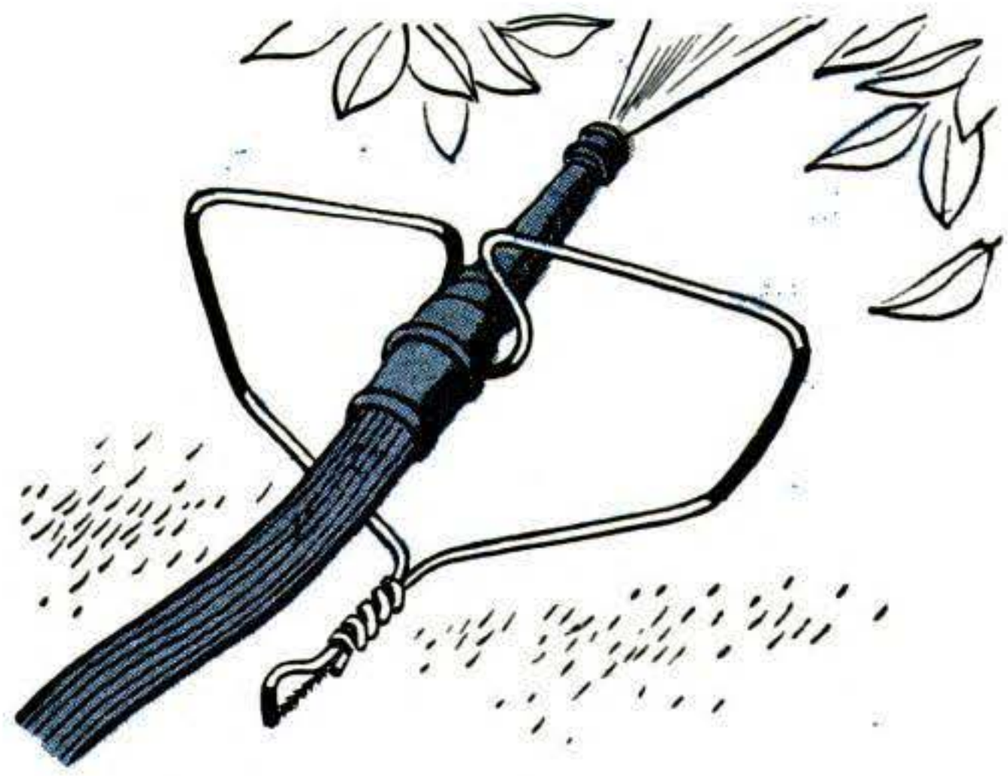
Copyrighted material

Keeping the Home Shipshape

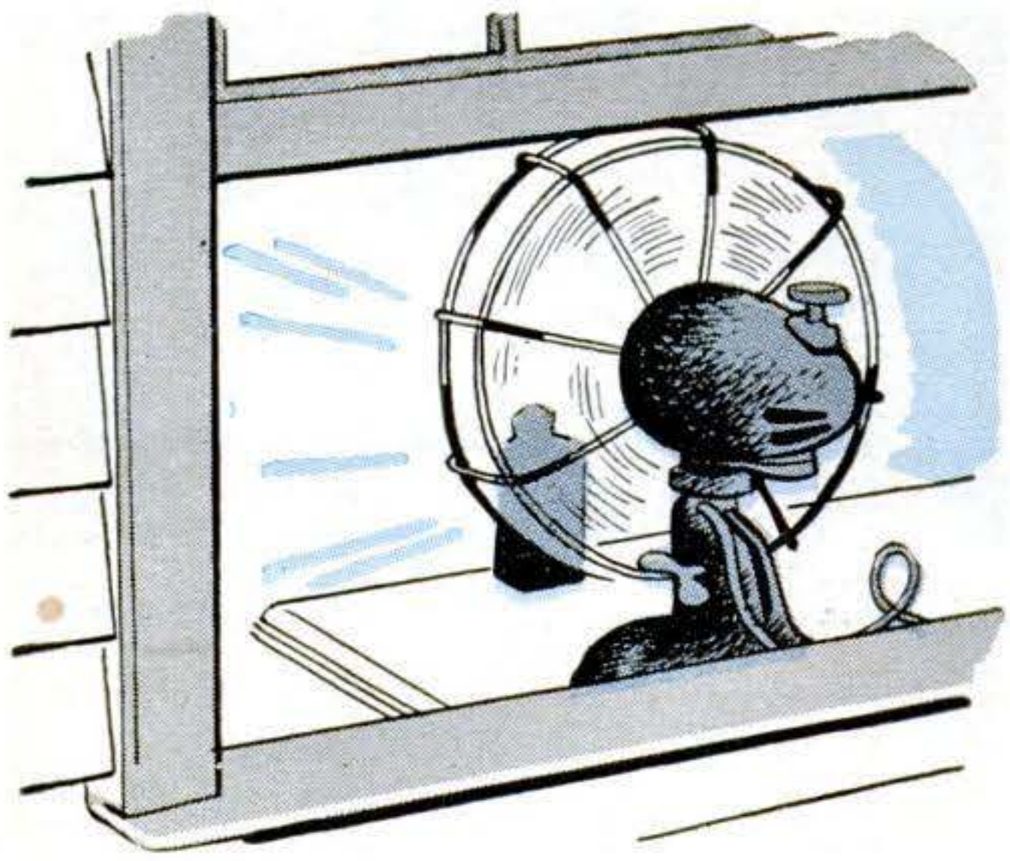
Old salt boxes, the kind with a metal pouring spout in the top, are fine for dry food supplies when camping. Shellac the outside to make them damp-proof, and label the contents.



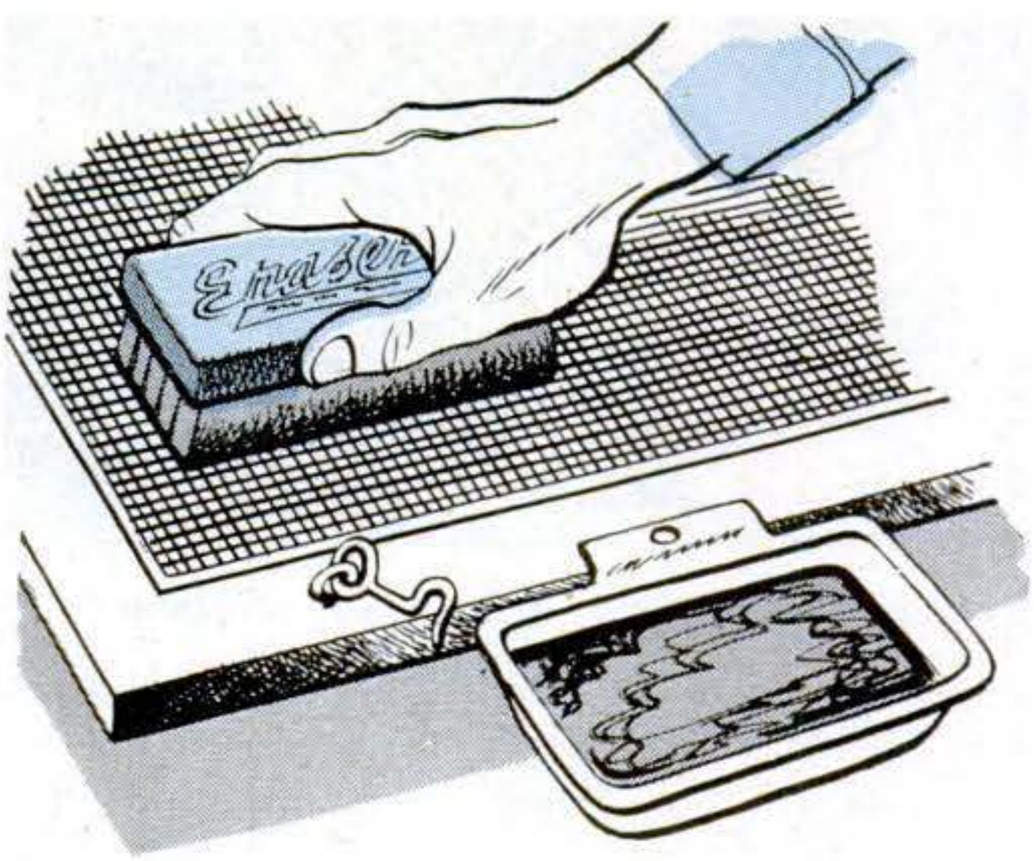
An insulating link, desirable on pull-chains located near water faucets, may be made with a bit of 3/16" o.d. rubber tubing. Secure the ends by lashing them with strong thread.



For aiming a hose at just the right spot to soak plants, bushes, or trees, a wire coat hanger forms a good holder. Though it can be bent as needed, it's stiff enough to stay put.

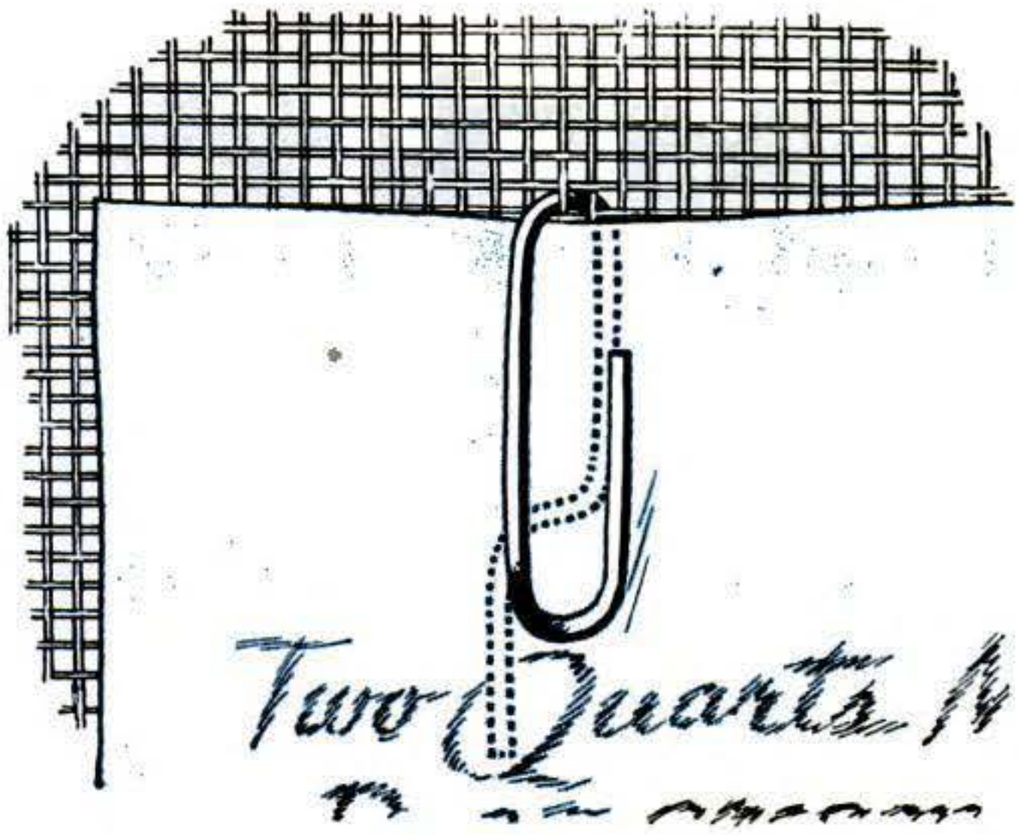


Wick-type air fresheners will do their work much faster if placed in the air stream of an electric fan. If air is drawn in from an open window, the process is still more rapid.

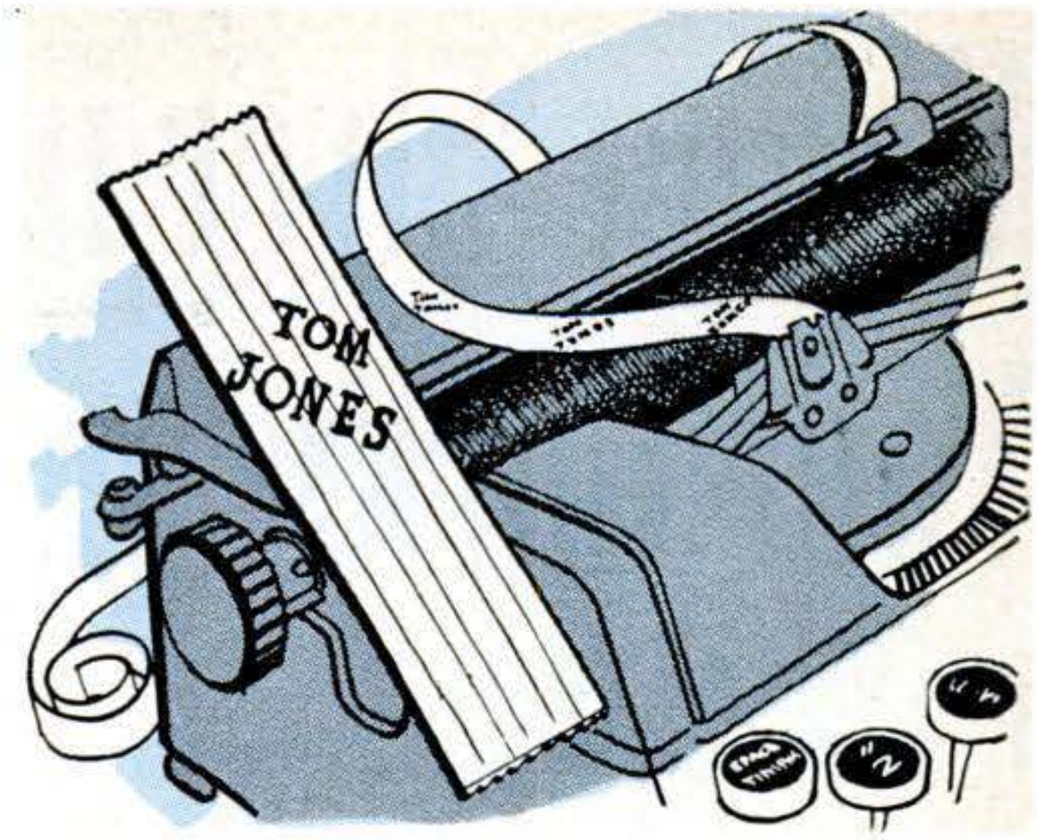


Equal parts of spar varnish and turpentine, well mixed, will give protection to window screens that'll often outlast paint. Apply with a well-cleaned old blackboard eraser.

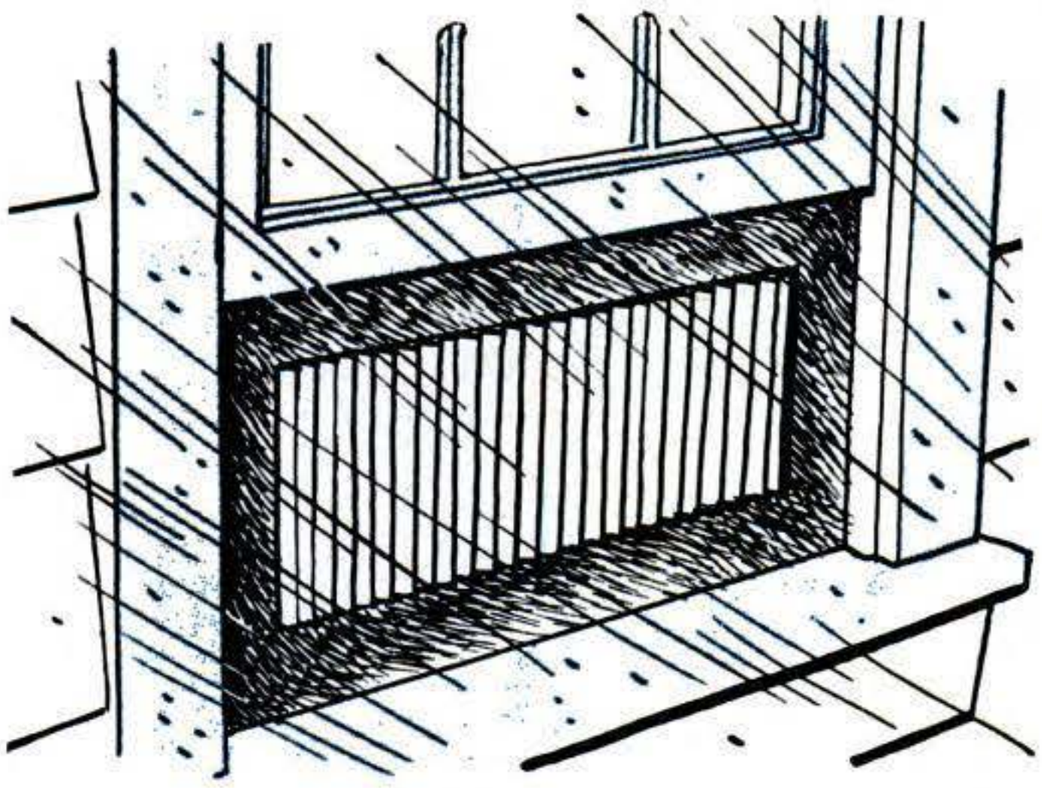
Copyrighted material



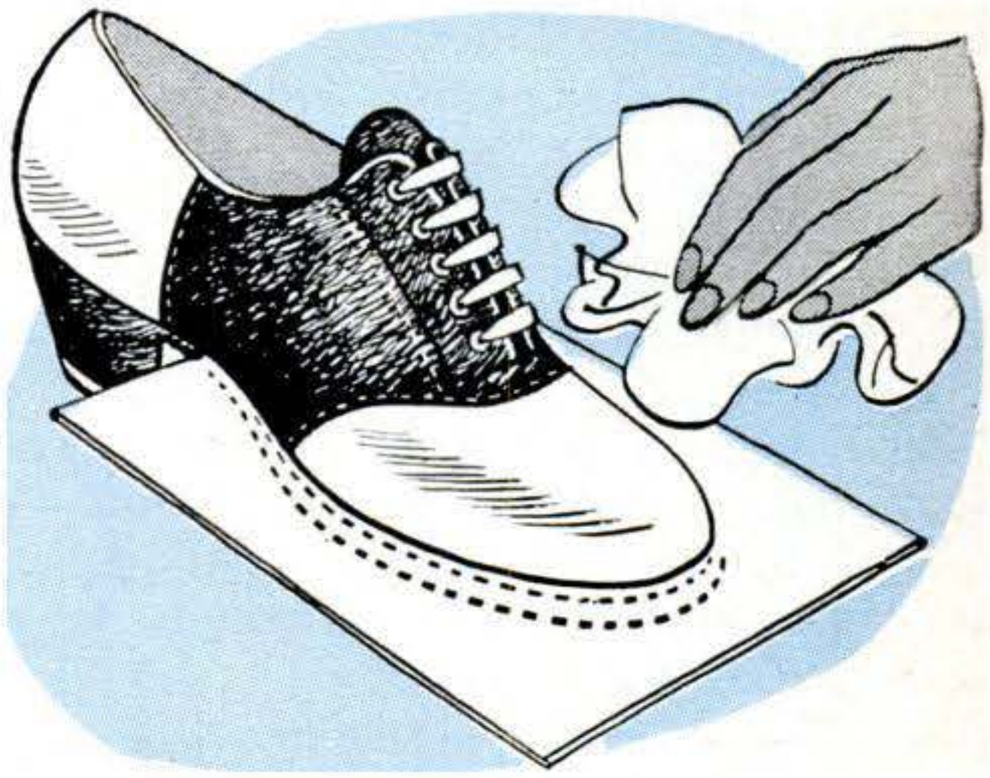
To leave a note on a screen door, bend down the inner prong of a paper clip and insert it through the screen from the outside. It will hold a small note even on a windy day.



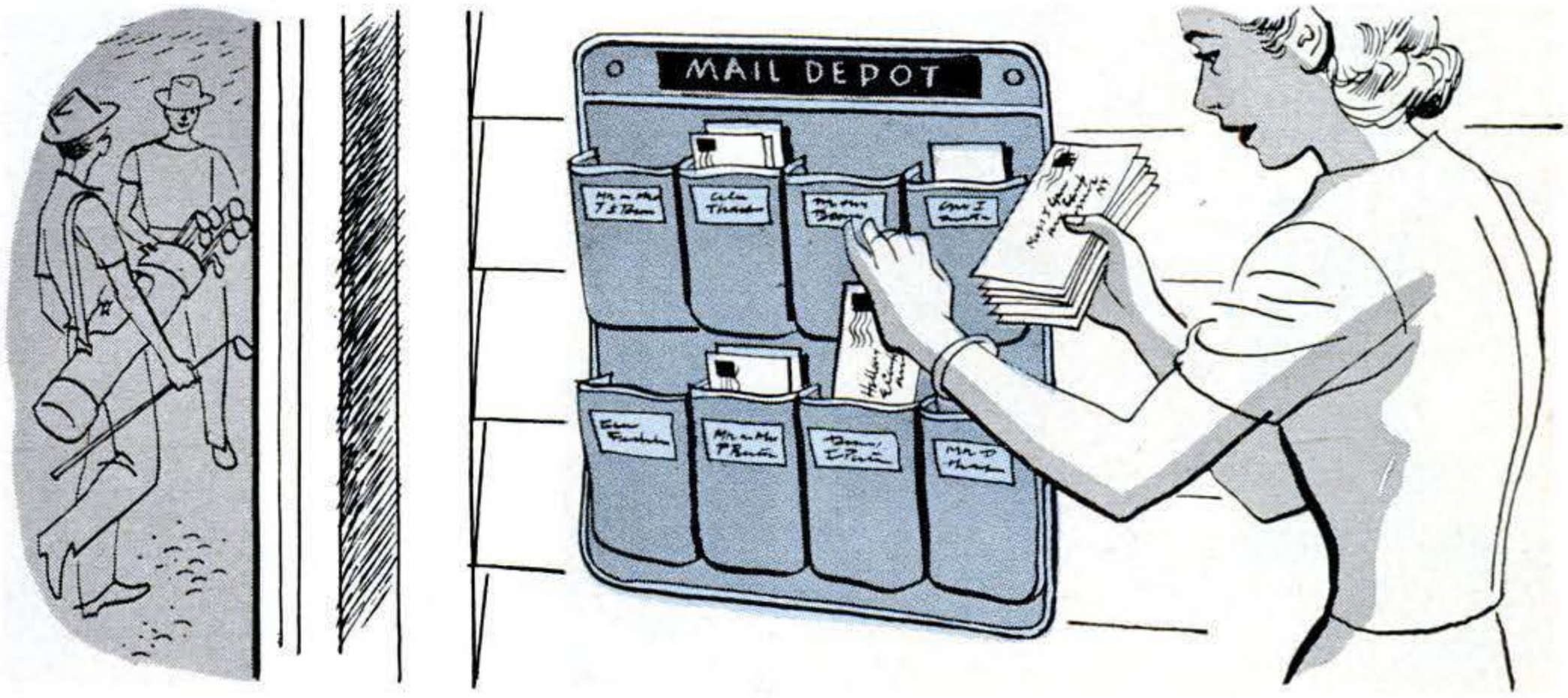
Name tapes for sewing in clothes can be made by writing on cloth tape with a typewriter. With a well-inked ribbon, they'll withstand many washings. Feed the tape in diagonally.



Fresh air even in driving rain can be had by closing a window on an old wooden shutter cut to fit in horizontally. Put it in with the slats sloping against the wind direction.



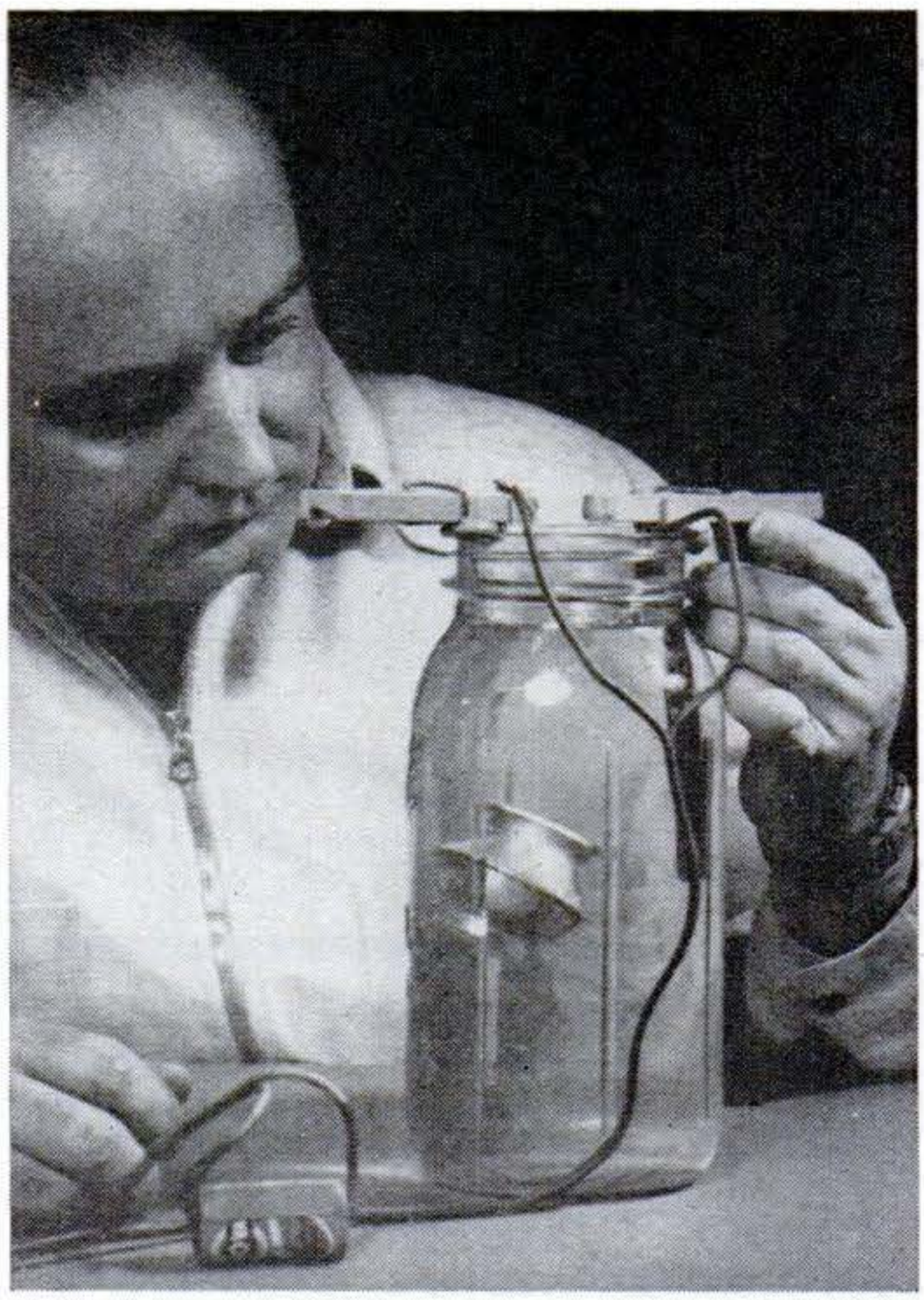
If you don't like white smears on the edges of sport-shoe soles, make a cardboard mask for use when applying the whiting. Turn it over to fit the other shoe of the pair.



A cloth shoe bag forms a convenient place to set out the sorted mail at a summer camp or rooming house. Label each pocket with a name and nail up the bag in a hall or on a porch.

Copyrighted material

Mining Silver in Your Darkroom



A "slinging wire" supports a toothpick holder in some used photo hypo while it is silverplated.

POURED down the drain by most amateur photographers is a solution that contains as much as 0.7 percent pure silver. Used hypo, which picks up silver from both prints and films, makes a fine experimental plating solution. While you will hardly find it profitable to recover this silver for its intrinsic value—as do large film processors—you can still use it to replate many small articles made of copper or brass.

The cost of silverplating with old hypo is almost nil, because for power you can use worn cells from your flashlight or flash gun. You probably replace synchronizer cells long before they're exhausted (you should, anyway).

Your first step is to neutralize the normal acidity of old hypo with a small amount of sodium hydroxide (lye) or sodium carbonate. Every trace of tarnish must be removed from the work, and it should be finally cleaned with a soapless household detergent to remove all traces of grease. Suspend the work in the neutralized hypo with a fine wire, which should be connected to the negative side (the casing) of a 1½-volt cell. A clean carbon rod removed from an old dry cell is connected to the positive (center) contact on the cell, and immersed opposite the work. The solution should be agitated occasionally.

Plating continues until either the cell or

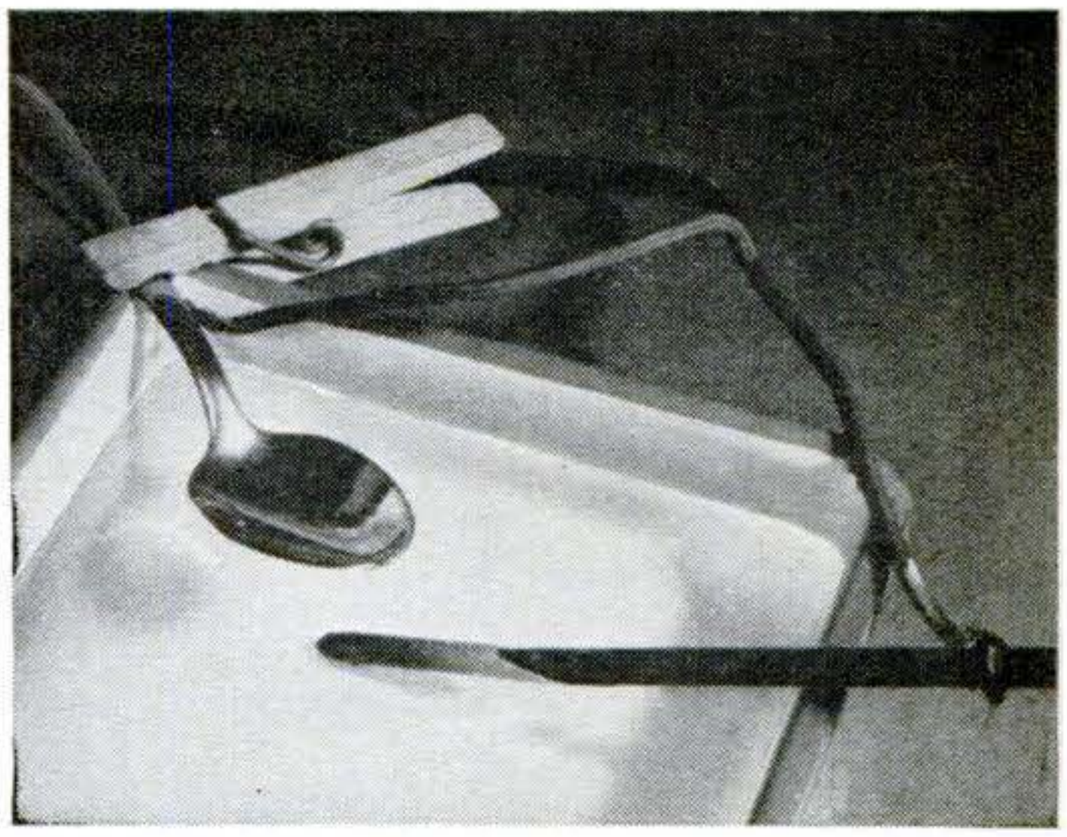
Silver is recovered with a carbon anode and a brass cathode. A clip holds the cell in place.

Polishing and cleaning before plating must be performed carefully to obtain a good final finish.

Copyrighted material

solution is exhausted. To test, dip a clean strip of brass into the solution and touch it to the wire holding the work. If plating is going on, a fine grey coating of silver will shortly appear on the test strip.

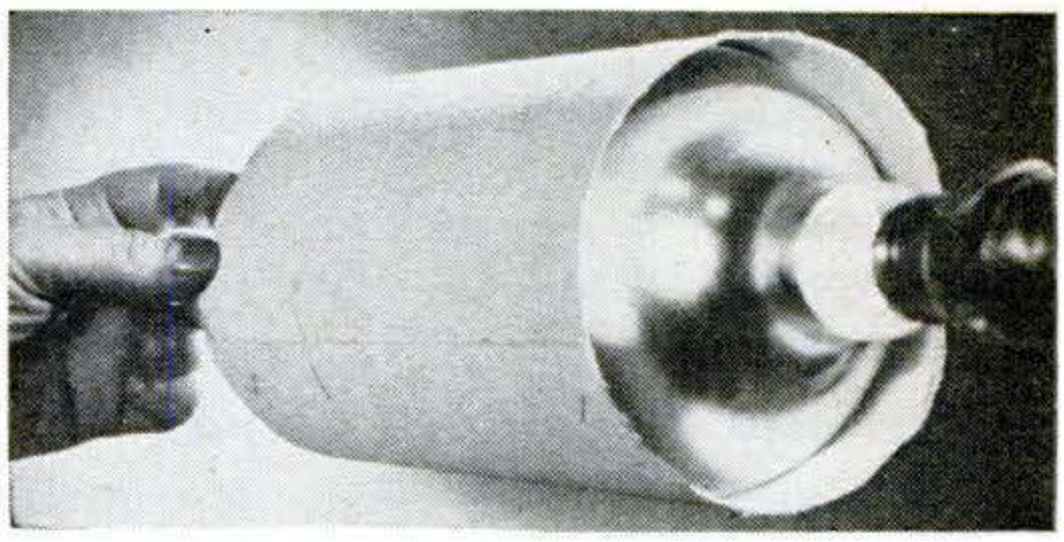
To plate an adherent deposit on brass or other copper alloy, the work should be "quickened," or dipped in a saturated solution of mercury nitrate and distilled water, after cleaning. Without this step, electrochemical action produces a nonadherent coating of silver even with no current. For best results, the work should be highly polished before plating, and repolished afterward with jeweler's rouge.—*Ken Murray, Colon, Mich.*

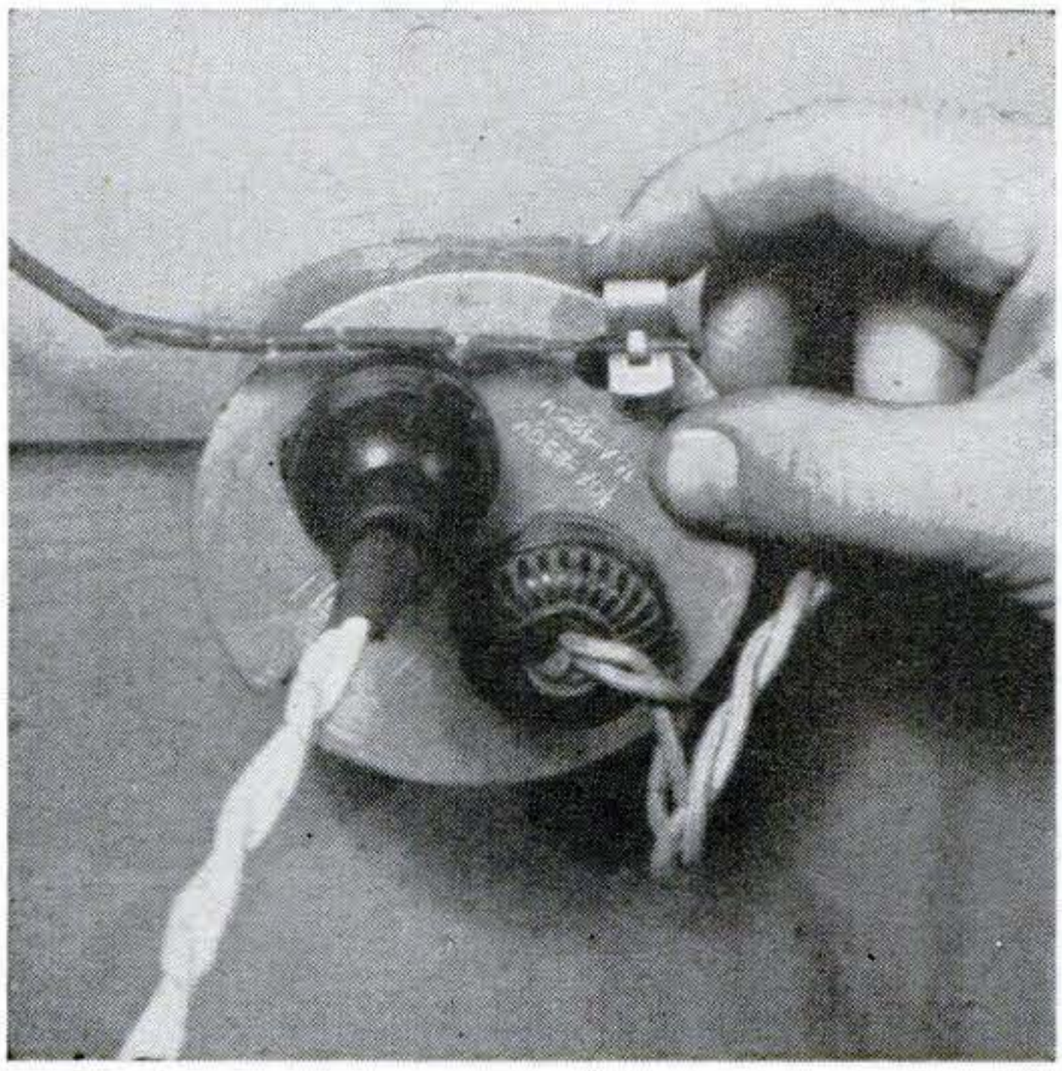


The back of a spoon bowl, which receives the greatest wear, can be replated with this setup.

Asbestos-Paper Tube Shields Reflector Lamp

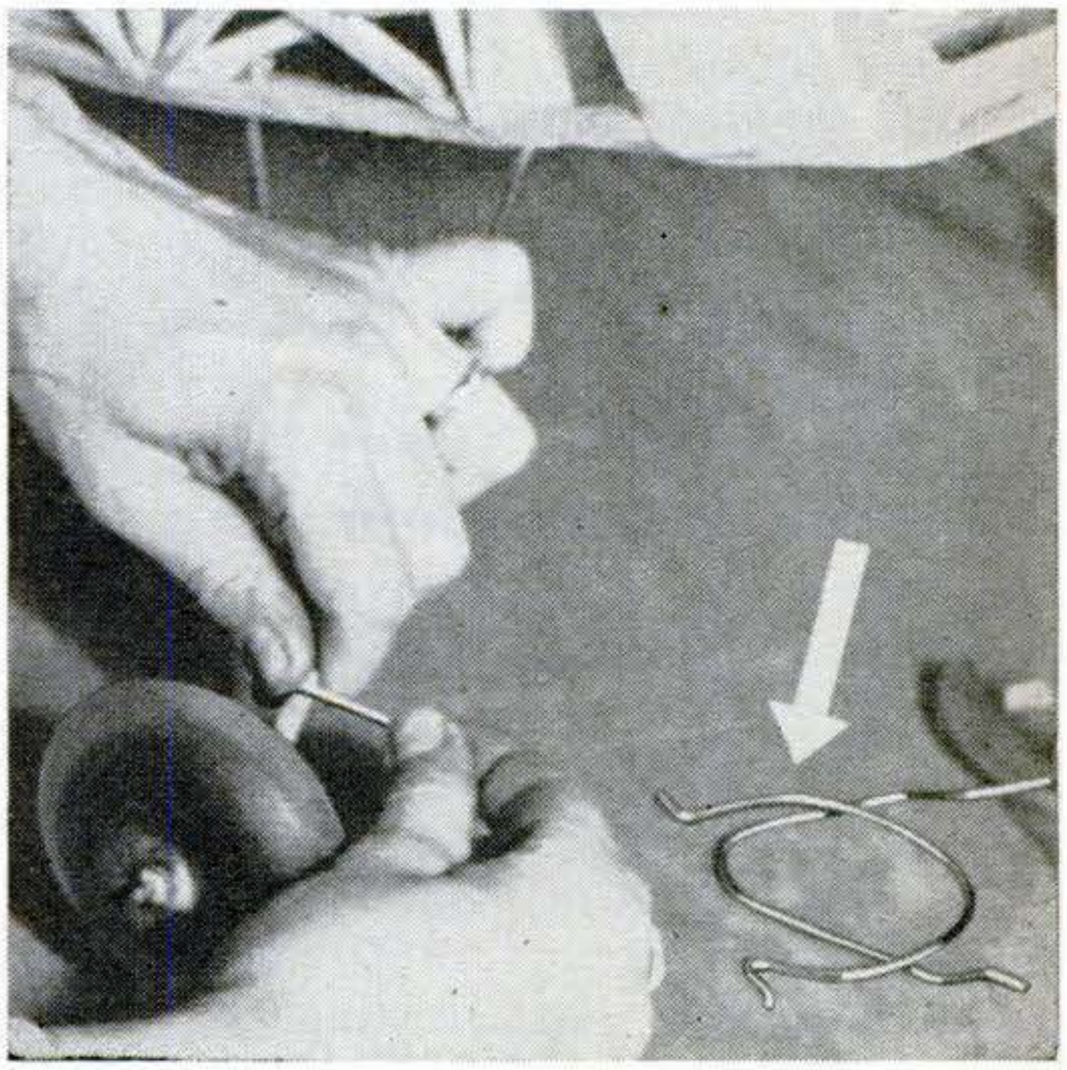
ROLLED into a tube and stapled, a piece of asbestos paper makes a fine "snoot" for a reflector-type photo lamp. If you adjust the size of the tube carefully before stapling, it will stay on the bulb without other support. The tube will be found especially useful in side lighting and back lighting, where without it direct light might strike the camera lens.





Outlet Box Serves as Ground

WHEN a ground connection is needed for a radio set or washing machine, it is often convenient to attach a terminal clip to a junction box that's fed through BX cable. The armored cable sheath normally makes a low-resistance connection to ground, and is usually handier than a water pipe.—*D. J. Bachner, Jackson Heights, N. Y.*



Milk-Cap Wire Aids Modelers

The tinned wire used to hold outer milk-bottle caps has many modelmaking uses. One of them, shown above, is for lashing the steel-wire landing gear of model planes. The wire is soft, readily handled, and solders well without cleaning. Better yet, a steady supply is delivered, free, to your door.—*M. C. Anderson, Globe, Ariz.*

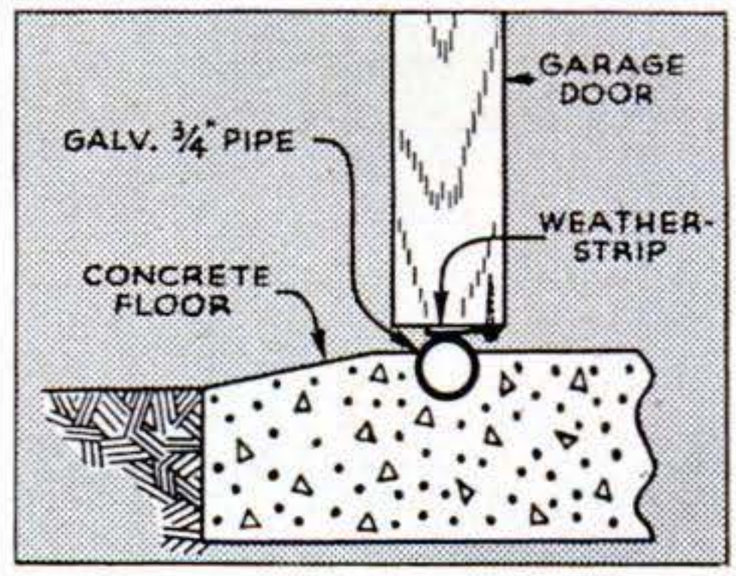
Copyrighted material

Machine Chops Stalks to Bits, Eases Plowing

Two sets of steel knives whirling at 1,000 r.p.m. in this new cornstalk cutter practically reduce the stalks to shreds and then spread the material evenly over the ground. This is said to have two advantages. The shreds are easily plowed under and won't pull out when harrowed. Corn borers are also mostly chopped up and those that remain don't have enough material to incubate. Silbaugh Mfg. Co., Humboldt, Iowa, makes it.

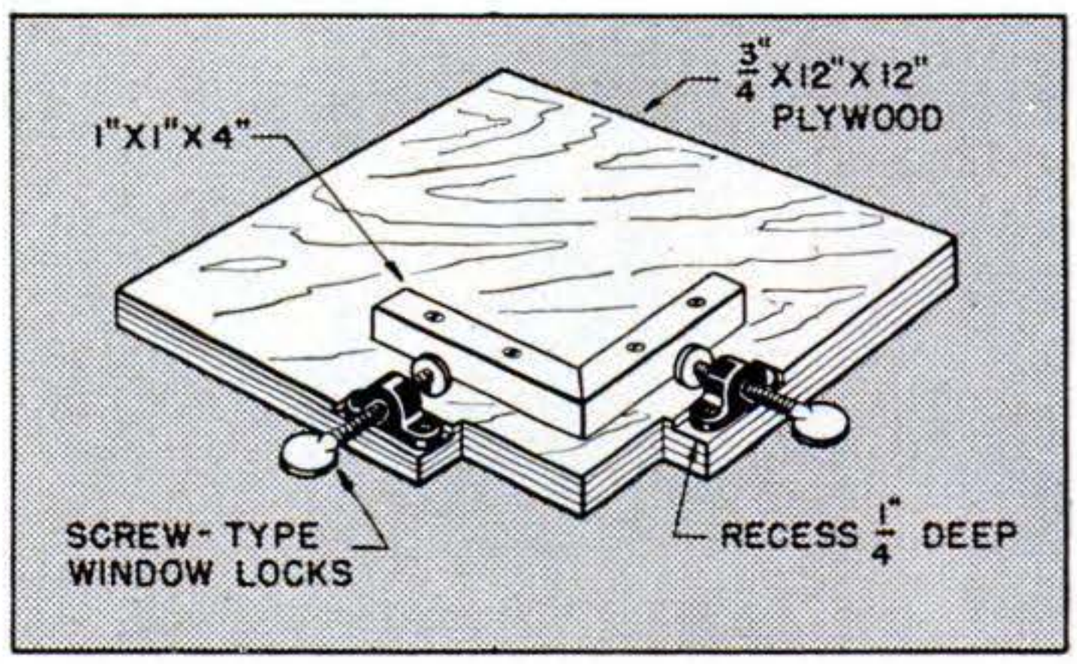
Pipe Seals Overhead Garage Doors

When overhead garage doors are installed, clearance usually is left at the bottom to prevent mud and ice from holding the door off its seat. This source of drafts can be eliminated by installing ¾" galvanized pipe under the entire length of the door, embedding it in concrete with about a third of its diameter above the sill. Weatherstrip tacked to the bottom of the door to fit snugly against the pipe will give a perfect closure.—*Ivan Baxter, Hartland, Wis.*



Coil Gives Short Rod Action of a Long One

Although it's only 21" long, a new casting and trolling rod is said to have the springiness and live action of a conventional full-length rod because of the spring coil incorporated in its length. The shortened casting arc also gives greater accuracy, less backlash, and the reduced length makes it easier to land a fish in the net. For carrying in a tackle box or traveling bag, the rod breaks down to two sections—with an overall length of 14". It is made by Waltco Products, Chicago, and sells for about $6.



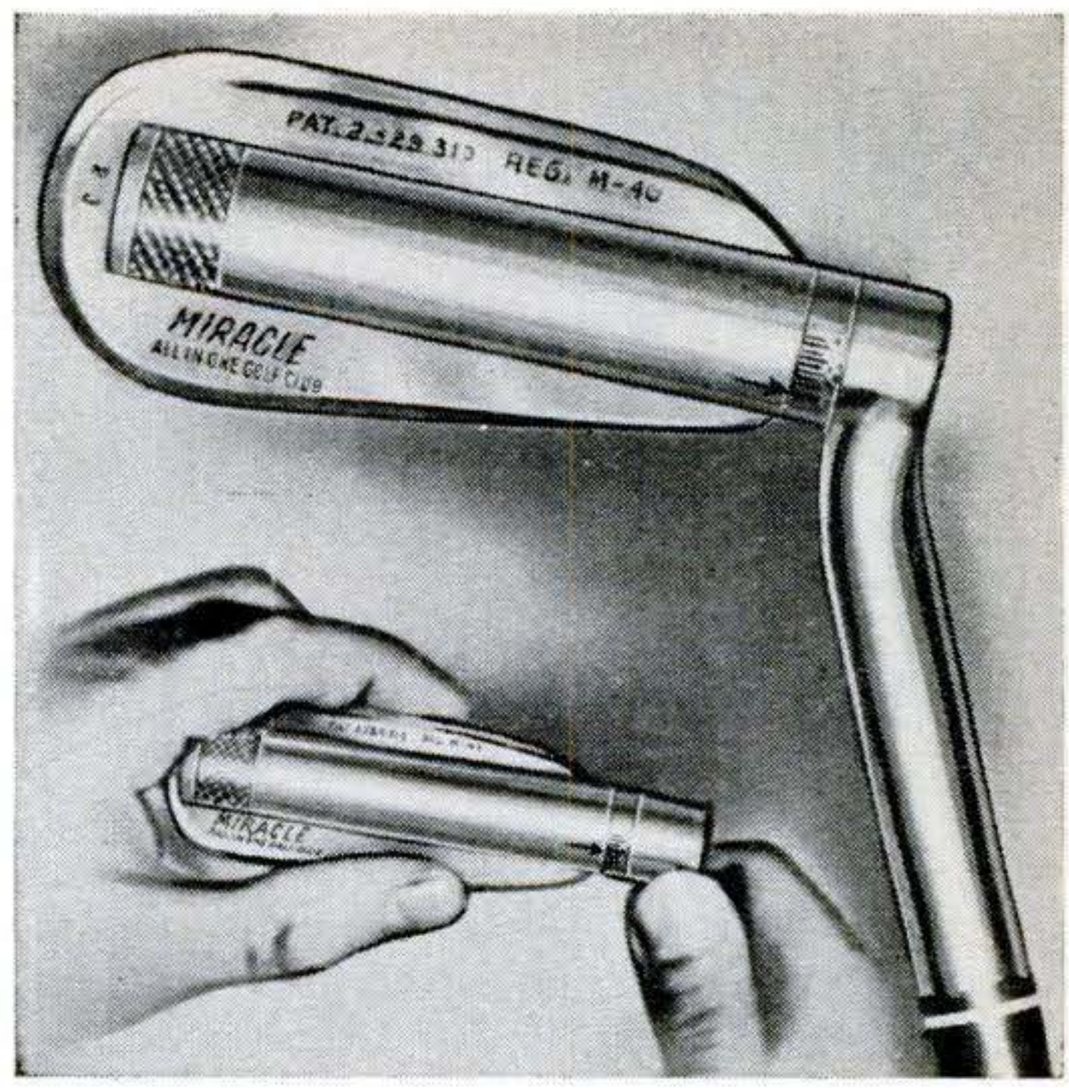
Jig Helps Assemble Frames

Faced with the job of making a number of picture frames for my home, I came up with this useful and inexpensive jig. After the miters are cut, the jig is used to clamp two adjacent frame members together while they are being nailed or a spline groove is being sawed. The recesses give clearance. —*Eugene C. Gottman, Brooklyn, N. Y.*

Copyrighted material

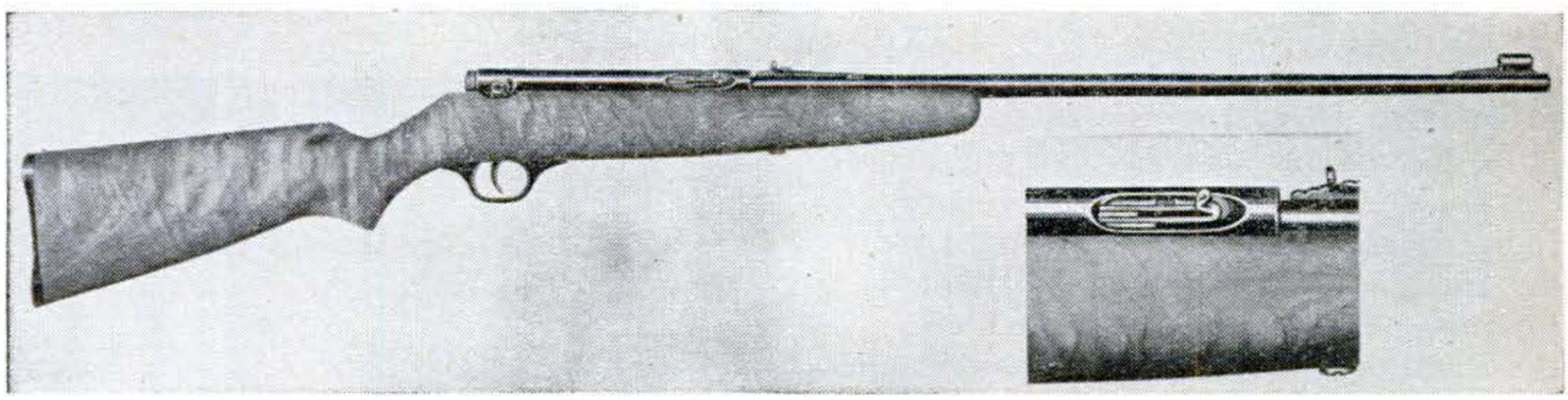
Gadgets for Play Hours

Guide Shows the Way. During daylight, a ten-cent guide distributed by Edward F. Lally, of State Farm, Mass., will give you general compass directions. Consisting of a sheet of clear plastic with an imprinted compass face, it's used by holding your watch level with the hour hand pointing at the sun, placing the South indicator over the hour hand, and then turning it (clockwise in the morning, counterclockwise after noon) until the indicator is half way between the hour hand and 12 o'clock. This is the general direction of south.



One Club Makes All Shots. By quickly made loft adjustments, this golf club is said to be suitable for any shot where you'd normally use anything from a No. 1 to No. 9 niblick. Since it also serves as a putter, you can play an entire game with just the one club. Made by the C. V. Winter Mfg. Co., Chicago, it sells for about $20.

Whistle 'Em Up. If you're fishing with this new bobber, you get double warning of a bite—a tug on the line and a whistle. Designed especially for night fishing or for use when several lines are in the water simultaneously, it's made by W. J. Jamison Co., Chicago.



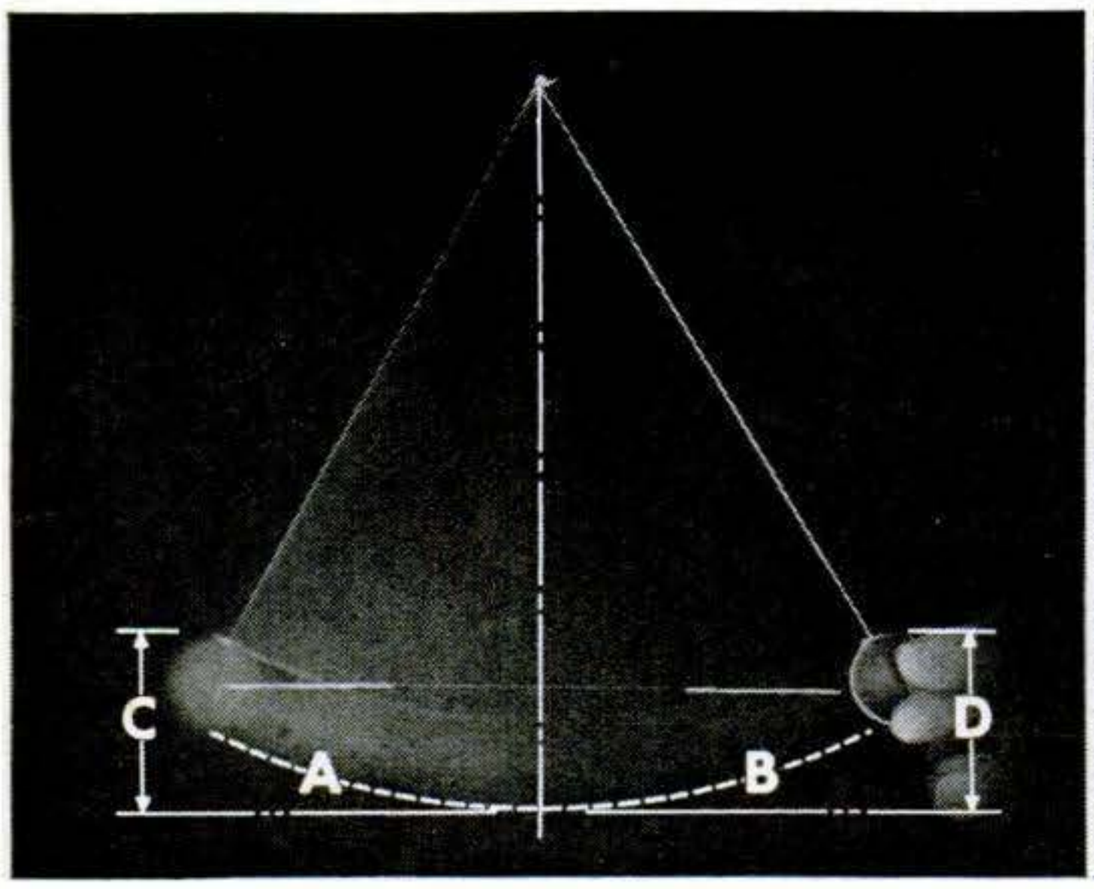
Dirt Kept from Rifle. In this new 15-shot semiautomatic .22-caliber Marlin, there are no cocking-handle slots back of the ejection port to allow entrance of dirt into the action. A lightweight cocking handle (insert) is located on the bolt in the ejection space, well forward on the receiver. The rifle, which is funnel loading with a tubular magazine feed, is 45″ long and weighs 6¾ lb.

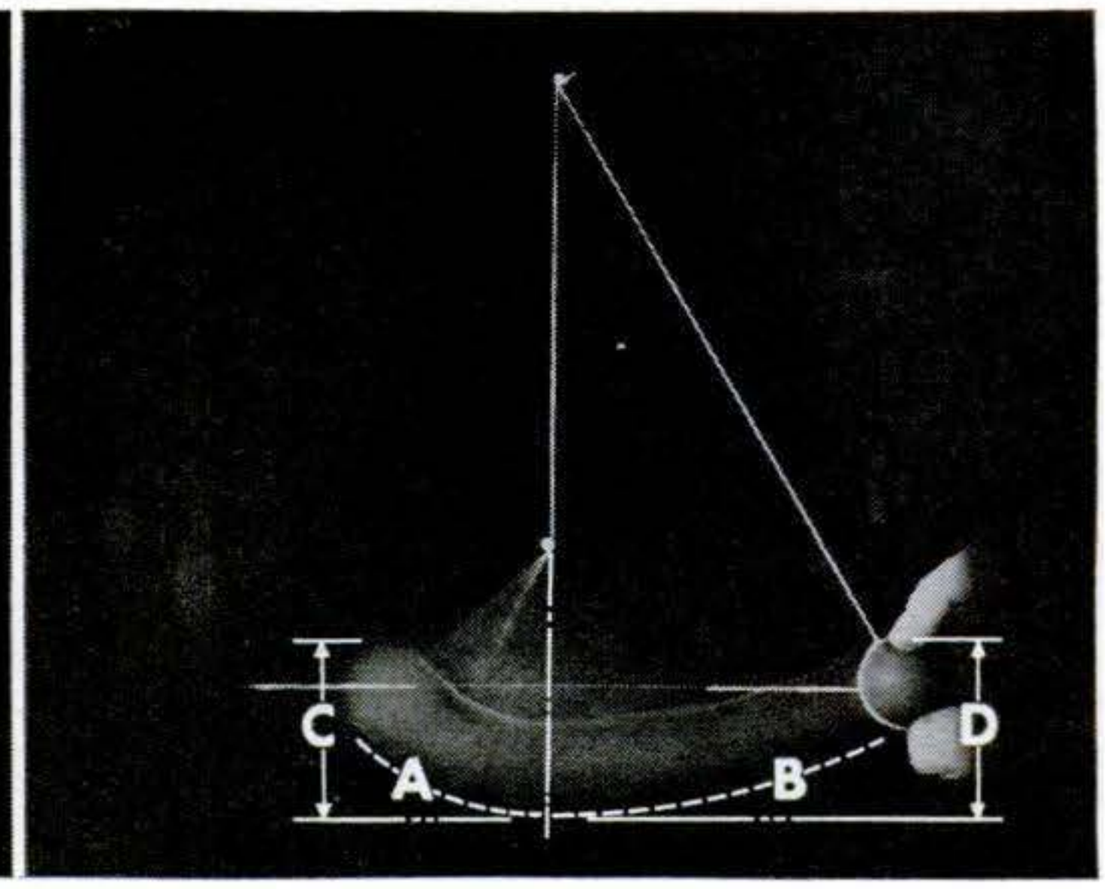
Copyrighted material

Experiments Prove You Can't Destroy Energy

BRIEFLY stated, the law of conservation of energy is this: energy is never created and never destroyed; in any situation where no outside energy is received and none is given up, the total available energy never changes, no matter what forms it may take.

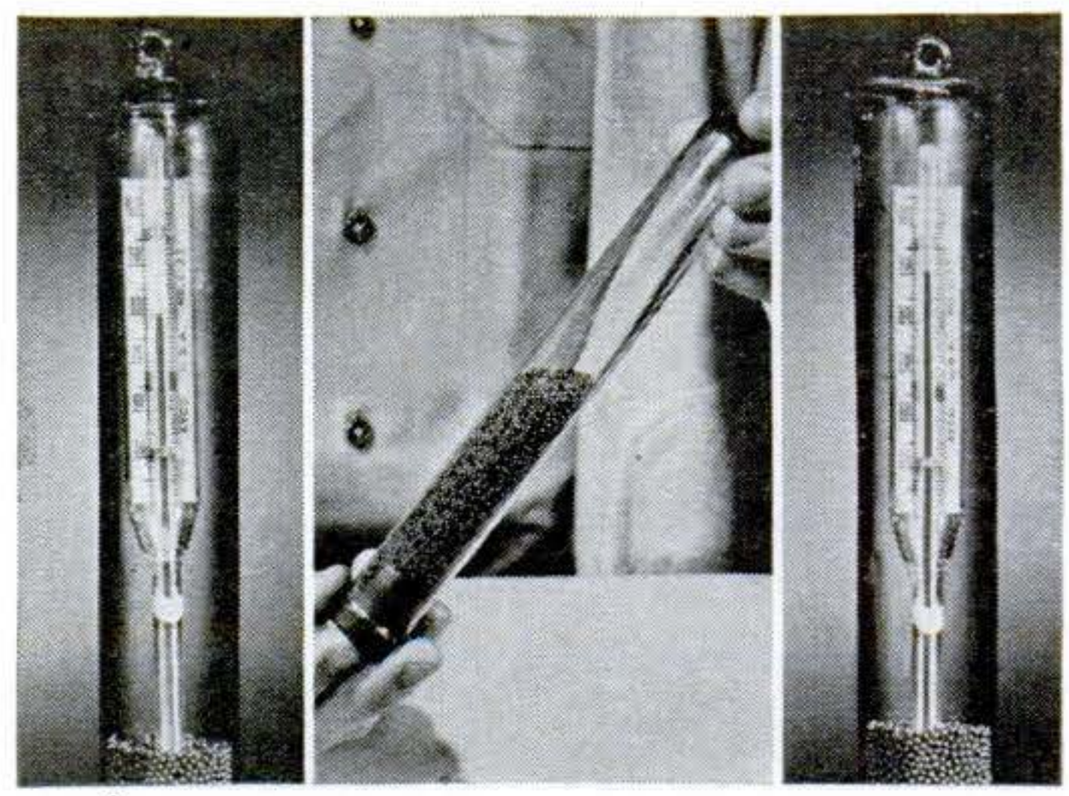
For instance, coal and oxygen unite to give heat energy, the heat energy changes water to steam, the molecular energy of the steam drives a turbine, the mechanical energy of the turbine runs a generator, and electric energy from the generator may then be transformed into light, sound, heat, mechanical, or chemical energy. If the energy lost by friction and escaping heat could be measured and added to all the energy produced by the devices actuated by the generator, you would have a total equaling the energy released by the combustion of the coal. Here are a few examples of how energy is transformed and conserved.



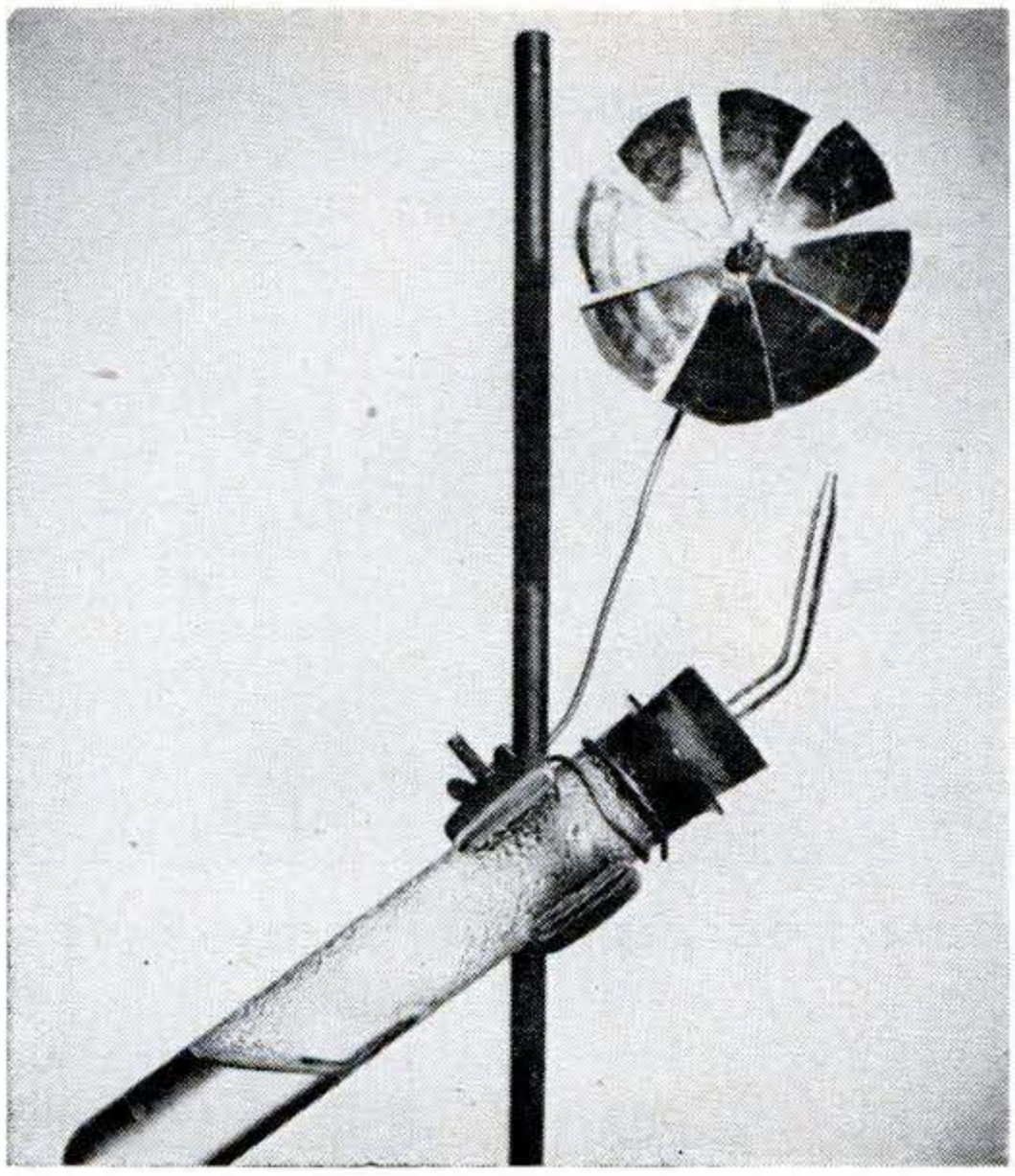


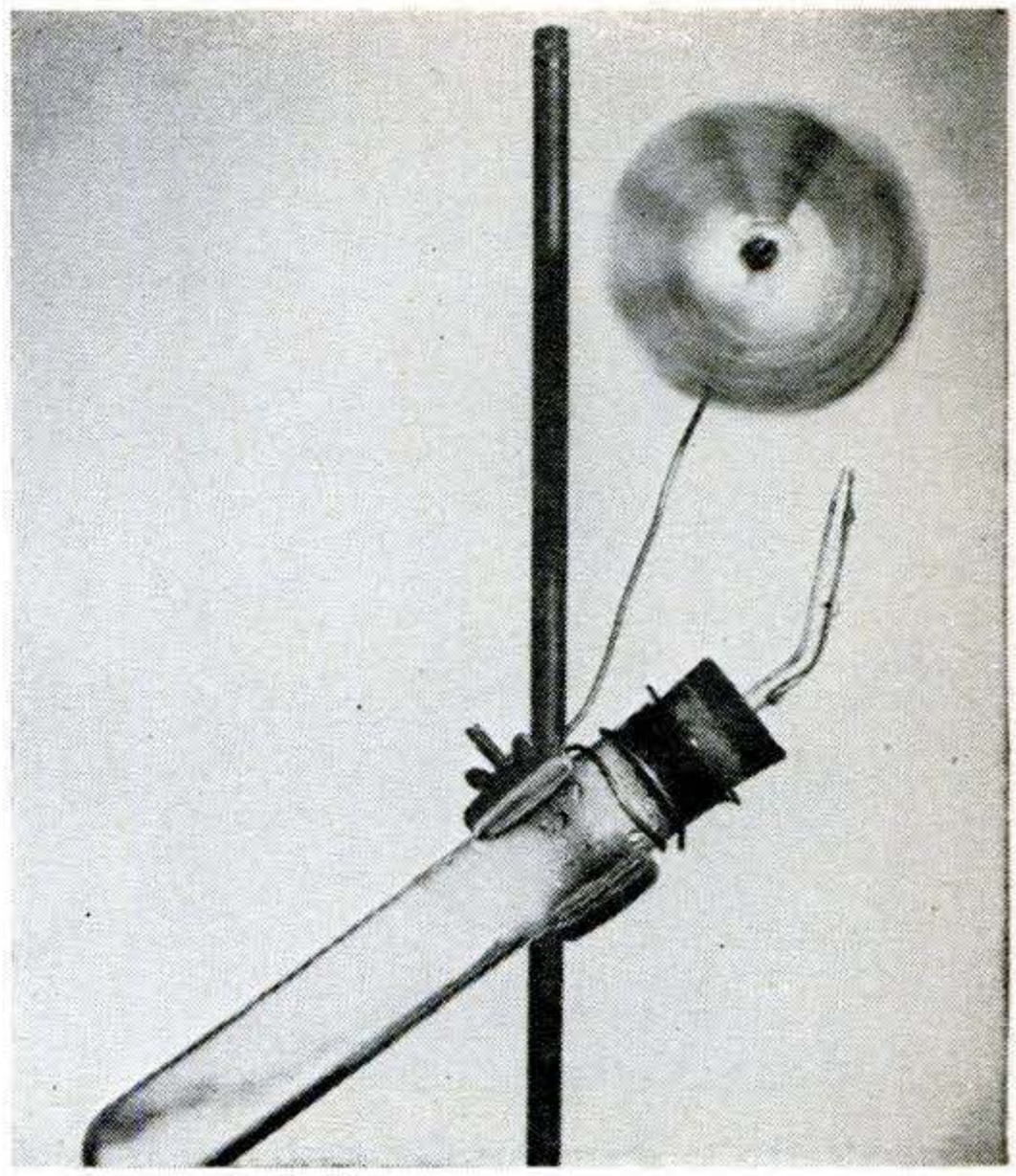
A Pendulum Is One Example. A swinging pendulum demonstrates conservation of mechanical energy. Except for slight friction and air-resistance losses, the bob swings as far beyond the vertical as the point from which it started (at left, A equals B). Significantly, it also rises to the same height, even when a nail on the vertical shortens the swing as at right (C always equals D). At the ends of its travel, the bob has no kinetic (motion) energy but its potential energy is at maximum. As it drops, kinetic energy increases and potential decreases. Beyond the lowest level, this is reversed. Disregarding friction losses, the sum of kinetic and potential energy is always the same.

Friction Produces Heat. When solids, liquids, or even gas molecules move over each other, mechanical énergy is changed into heat energy. Primitive peoples use this heat of friction to light fires, moderns use it in cigarette lighters. To demonstrate this change of energy forms, put several ounces of lead shot into a large test tube and measure the temperature of the shot. Then stopper the tube and rapidly turn it end for end at least 100 times. If you now take the temperature of the shot you will find it has increased measurably.

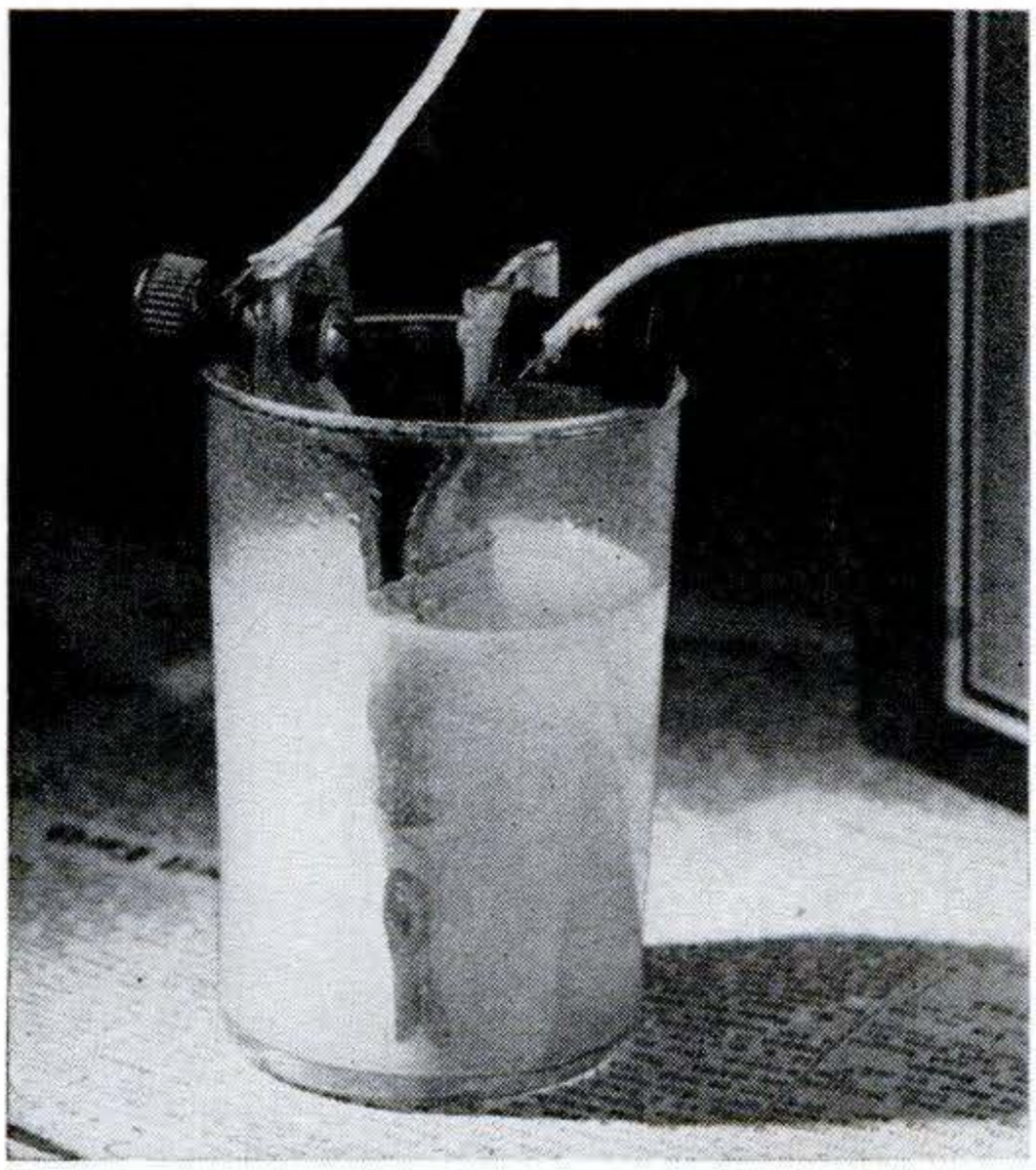


Copyrighted material



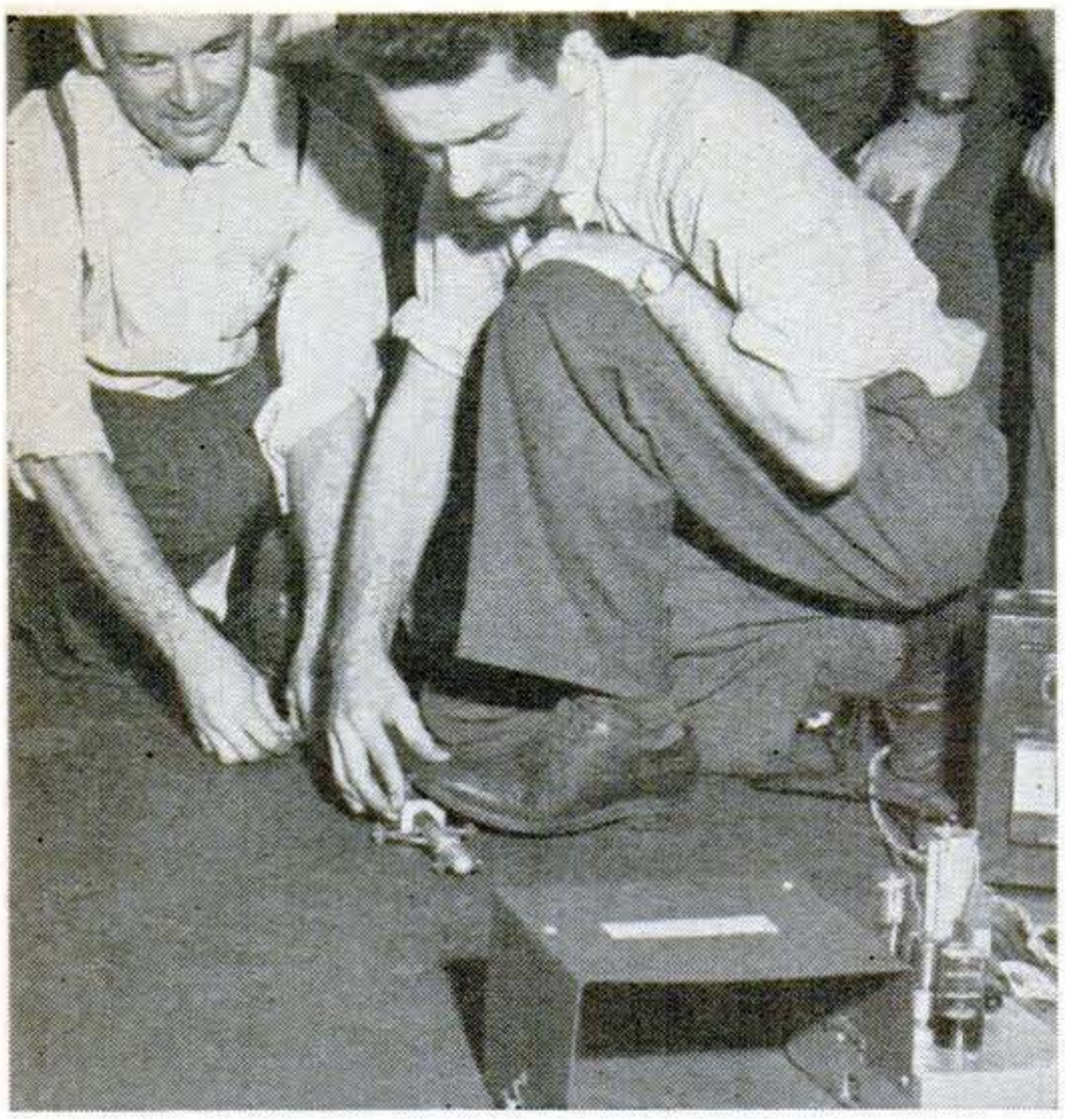


Energy Chain Runs Pinwheel. This simplified version of a steam turbine is an example of how energy may pass through a chain of transformations before finally performing a desired job. When gas is burned under the test tube at the left, chemical energy is released as heat energy. The heat changes the water to steam, and the latter, emerging from the nozzle at high speed, revolves the pinwheel by mechanical energy.



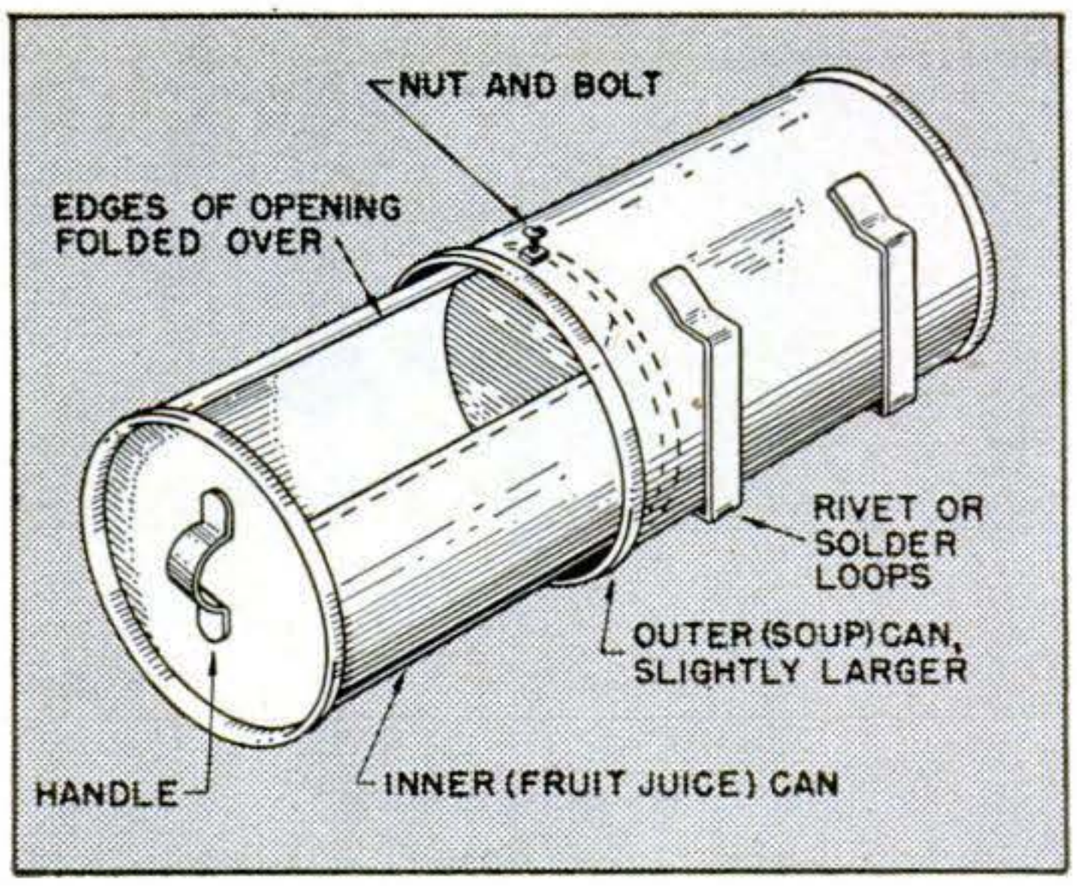
Battery Stores Up Energy. In a battery, electrical energy is stored up as potential chemical energy, but it changes back to electrical energy. You can make a simple storage battery to illustrate this. Fasten a binding post to each of two 1″ by 5″ lead strips, separate the strips with two matchsticks and bind them firmly with rubber bands. Immerse the plates in 4 oz. of water to which you have added 1 oz. of concentrated sulphuric acid, and run wires to four dry cells connected in series, retaining the connection about 10 minutes. Then connect your battery to an electric bell. In the bell, magnetic effects change the electrical energy from the battery into mechanical energy. Part of the mechanical energy then changes into sound and heat.

Copyrighted material



Electronic Timer Checks Racer

WHEN engineers in the East Pittsburgh plant of Westinghouse took up fizz racing as a noon-hour hobby, they rigged an electronic timer to check the speed of their midget speedsters. Jet-propelled by carbon-dioxide cartridges, the tiny racers hit speeds as high as 131 m.p.h. in little more than a second on a course 160′ long. At first the engineers used four-wheel cars weighing 8 oz., but they eventually discarded the wheels in favor of skids and reduced the weight to less than an ounce.

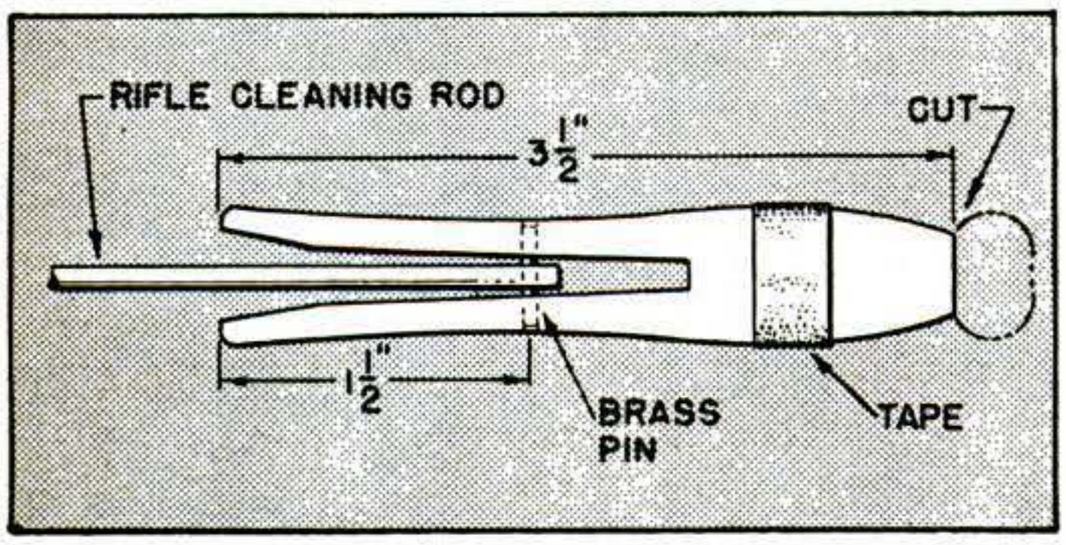


Bait Container Held by Belt

FISHERMEN will find this bait container a convenience. Two metal loops soldered to the outer can provide a means of attaching the container to your belt. To get bait, you pull out the inner can. A nut and bolt in a hole punched along the edge of the larger can prevent the bait can from falling out. A coat of lacquer will keep it from rusting. —*Ken Murray, Colon, Mich.*

Acid-Core Solder Is Leakproof

A NEW solder produced by Alpha Metals, Inc., of Brooklyn, N. Y., has the acid flux in paste form. Virtually nonsputtering, this flows only as far back as the solder is melted, eliminating fluxless portions.



Clothespin Cleans Shotguns

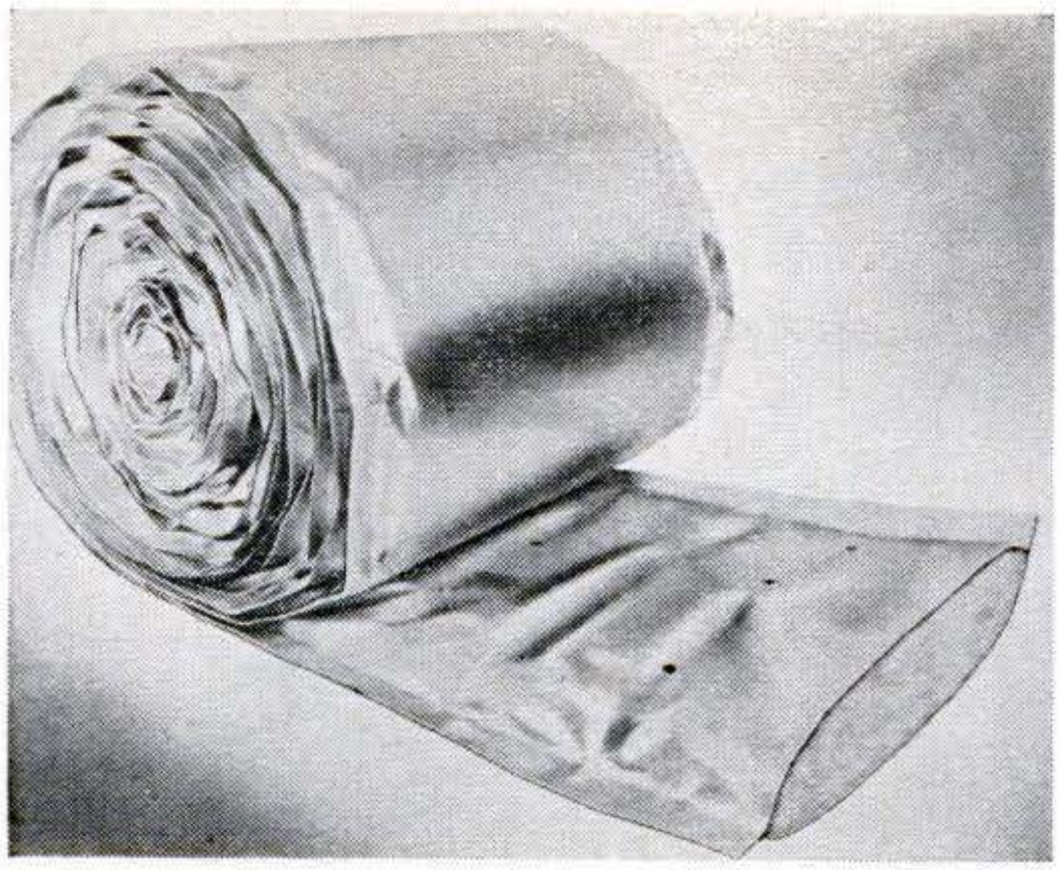
WITH a common wood clothespin, you can easily adapt a rifle cleaning rod for the same purpose in a shotgun. Saw off the knob, drill holes through the legs, and press a tight-fitting 1/16″ brass pin through the holes and the rifle-rod slot. Be careful that the pin doesn't protrude.

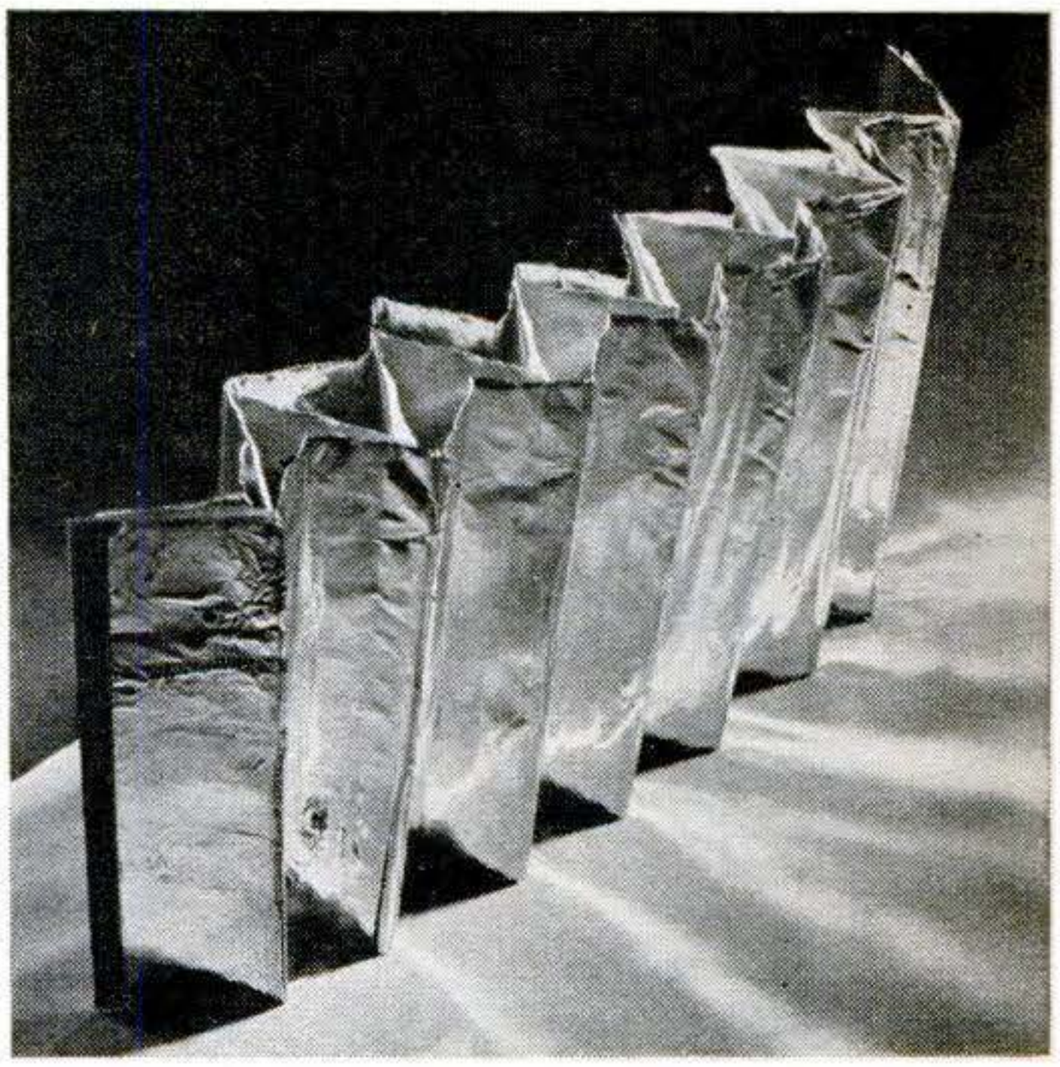
An oil rag around the clothespin makes it fit 16-gauge shotguns, while a little sanding will suit it to 20-gauge guns. For 12-gauge, build up the diameter with a layer of tape. —*Dick Pearson, Los Angeles.*

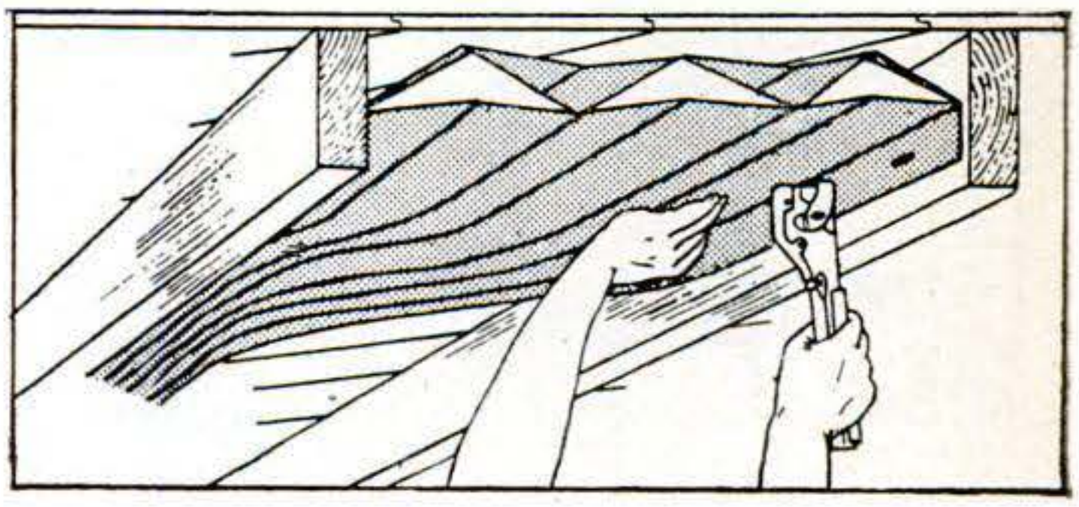
Mechanic's Light Fits on Head

DESIGNED especially for the use of mechanics, this light leaves both hands free for work and is easily aimed by means of a swivel bracket. Two flashlight dry cells are used, an adjustable elastic band insures a good fit, and rubber pads keep it comfortable. It's made by Justrite Mfg. Co., Chicago, and sells for about $6.

Copyrighted material





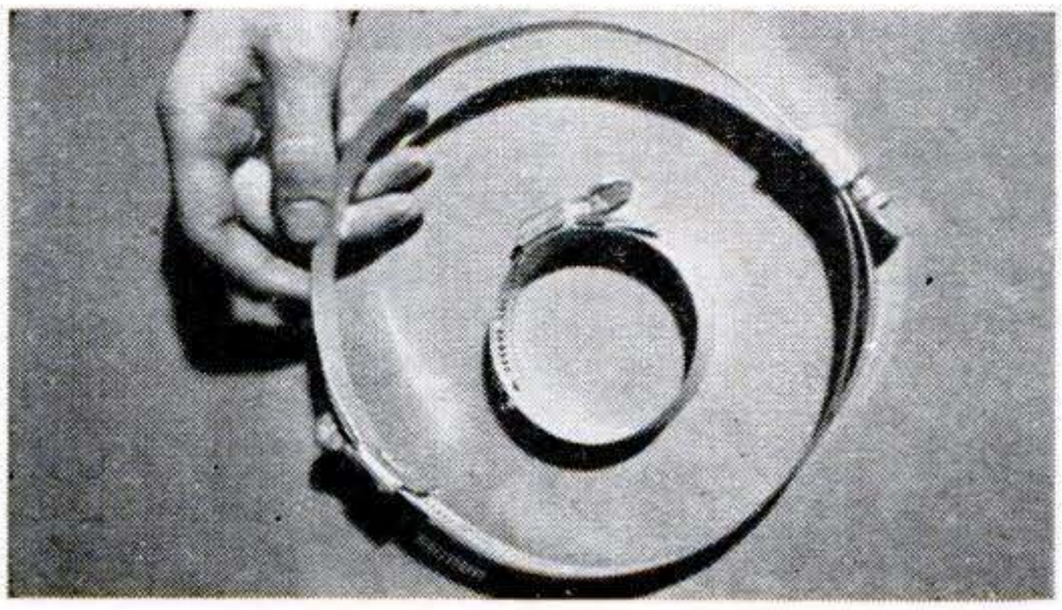


New Insulation Prevents Escape of Radiant Heat

CONSERVATION of radiant heat is a major objective of two home-insulating products recently placed on the market. In each, the insulation has a reflecting outer surface to turn back radiant heat, as well as interior air spaces to reduce heat loss through conduction and convection. Both materials are said to be flame and verminproof.

A product of the Gilman Brothers Company, of Gilman, Conn., the roll insulation above consists of two reflective metallic sheets that enclose a fluffy fiber blanket containing millions of dead air spaces. Nailing flanges are provided for easy installation.

Packed flat for shipping, the insulation at the right opens up in accordion fashion for installation. A product of Infra Insulation, Inc., of New York, it has aluminum foil on both faces, with a fiber separating foundation. When installed, as in the drawing, the lower surface is flat.



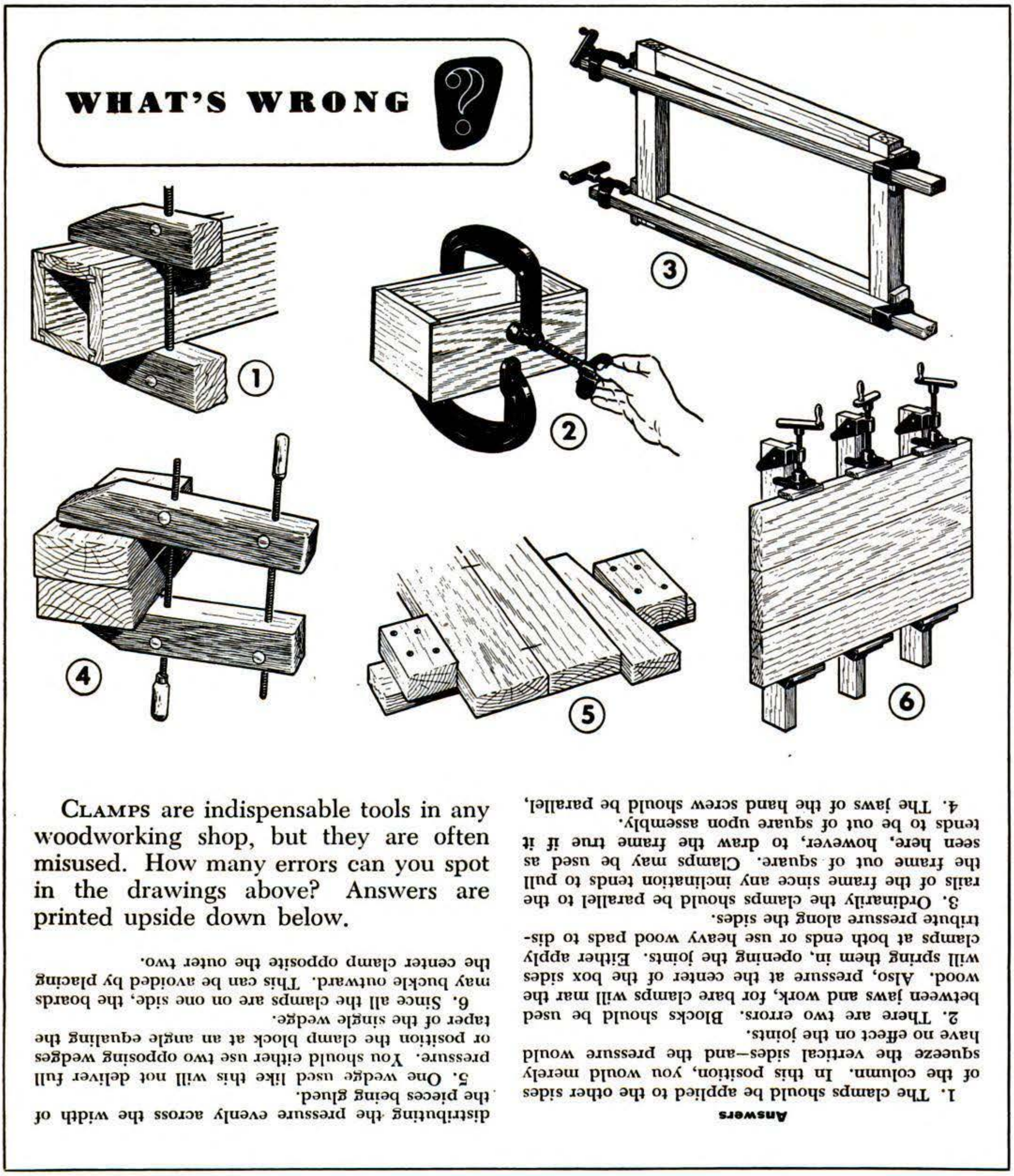
Two Clamps Make a Big One

A LARGE clamp for use in such jobs as repairing automobile mufflers, stovepipes, and similar cylindrical objects can be made by screwing together two small clamps of the type shown in this photograph. Since it is possible to buy these in quite a variety of sizes, large clamps of practically any diameter can be produced by making the proper combinations of smaller ones.—*Don G. Pittwood, Moscow, Idaho.*

Campfire Made in Coffee Can

DURING a recent camping trip, I solved the problem of a breakfast fire one rainy morning with a coffee can, dirt, pebbles, and a half pint of gasoline. After the can was half filled with dirt, I filled it with pebbles, poured in the gasoline, put the can in a hole in the ground, and touched a match to it.—*Charles Powell, St. Louis, Mo.*

Copyrighted material



CLAMPS are indispensable tools in any woodworking shop, but they are often misused. How many errors can you spot in the drawings above? Answers are printed upside down below.

Answers

1. The clamps should be applied to the other sides of the column. In this position, you would merely squeeze the vertical sides—and the pressure would have no effect on the joints.

2. There are two errors. Blocks should be used between jaws and work, for bare clamps will mar the wood. Also, pressure at the center of the box sides will spring them in, opening the joints. Either apply clamps at both ends or use heavy wood pads to distribute pressure along the sides.

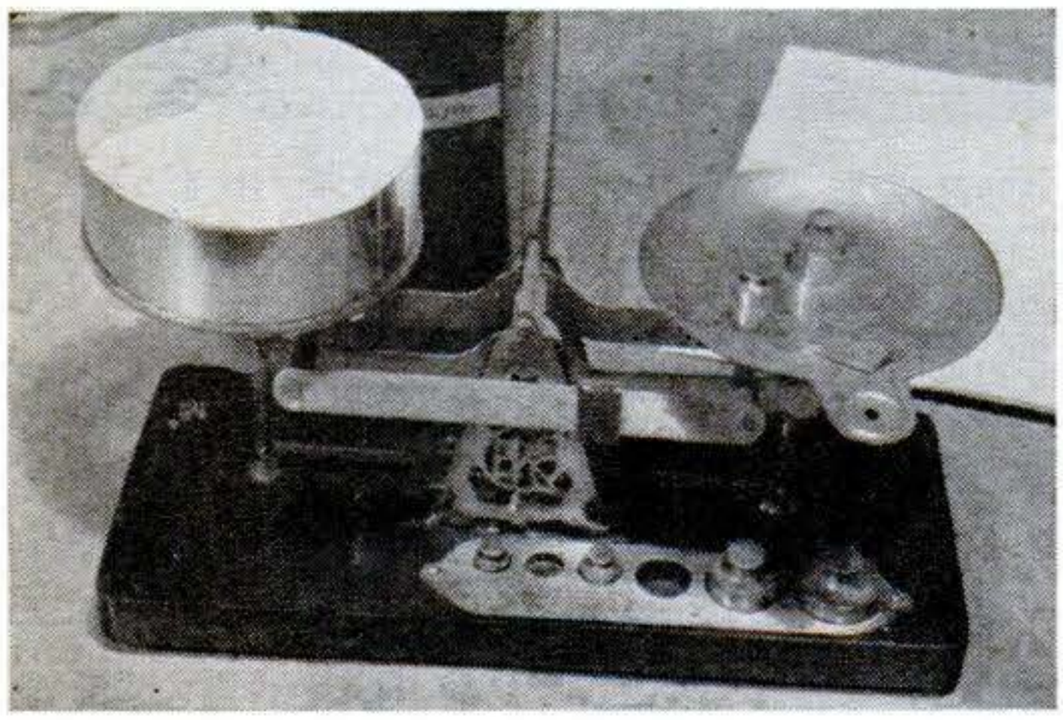
3. Ordinarily the clamps should be parallel to the rails of the frame since any inclination tends to pull the frame out of square. Clamps may be used as seen here, however, to draw the frame true if it tends to be out of square upon assembly.

4. The jaws of the hand screw should be parallel, distributing the pressure evenly across the width of the pieces being glued.

5. One wedge used like this will not deliver full pressure. You should either use two opposing wedges or position the clamp block at an angle equaling the taper of the single wedge.

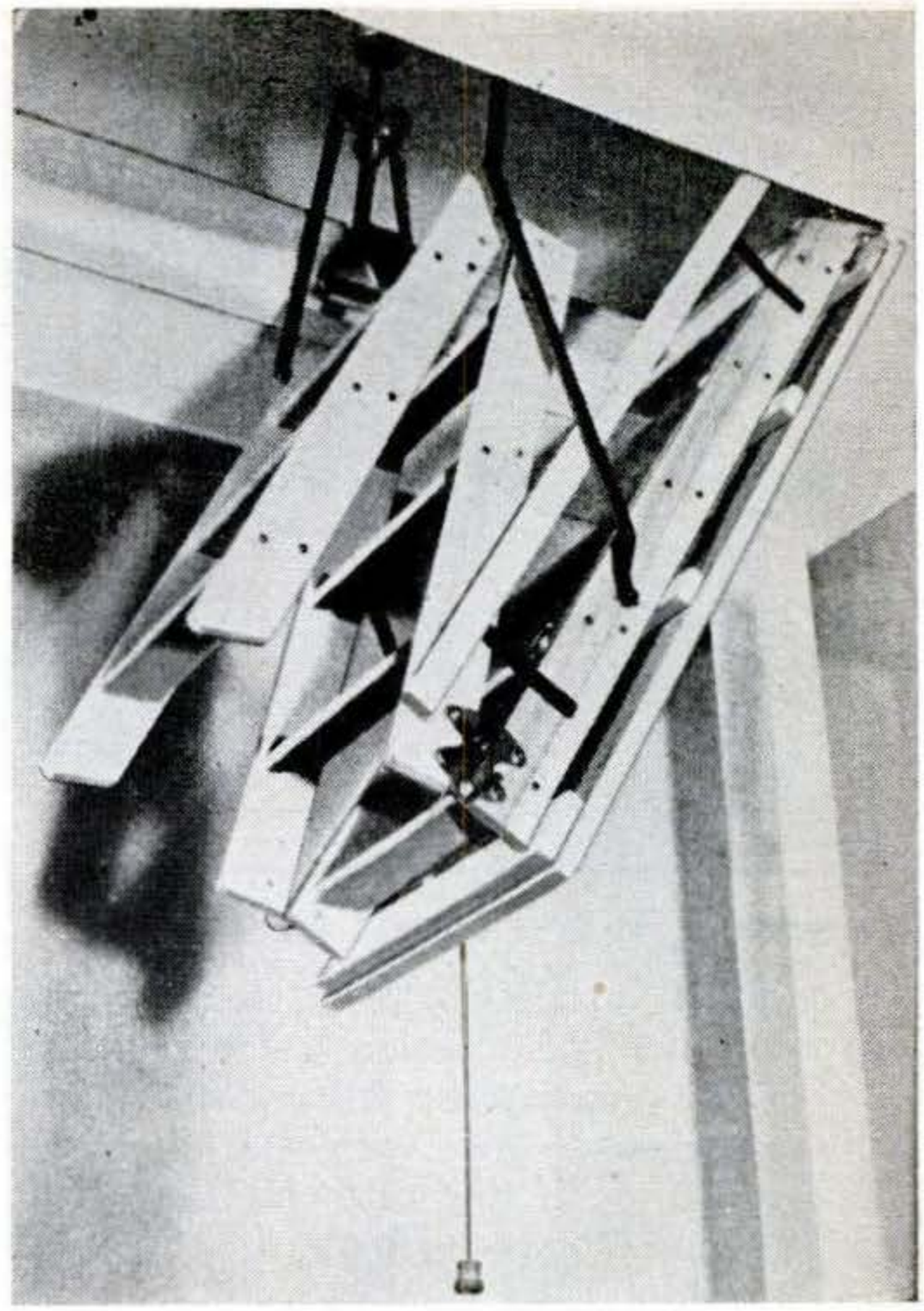
6. Since all the clamps are on one side, the boards may buckle outward. This can be avoided by placing the center clamp opposite the outer two.

Extra Tray Increases Volume Capacity of Scales



WITH laboratory scales, it is often necessary to weigh several batches of light chemicals to get the required amount. To weigh such chemicals in one batch, make an oversize tray from a tin can and file the edges smooth. Install this in place of the regular tray and balance it with a piece of lead or wire solder. Then when you are weighing chemicals, use this special weight in addition to the regular weights. Keep the special weight with the tray for future use.—*Will Thomas, Kenmore, N. Y.*

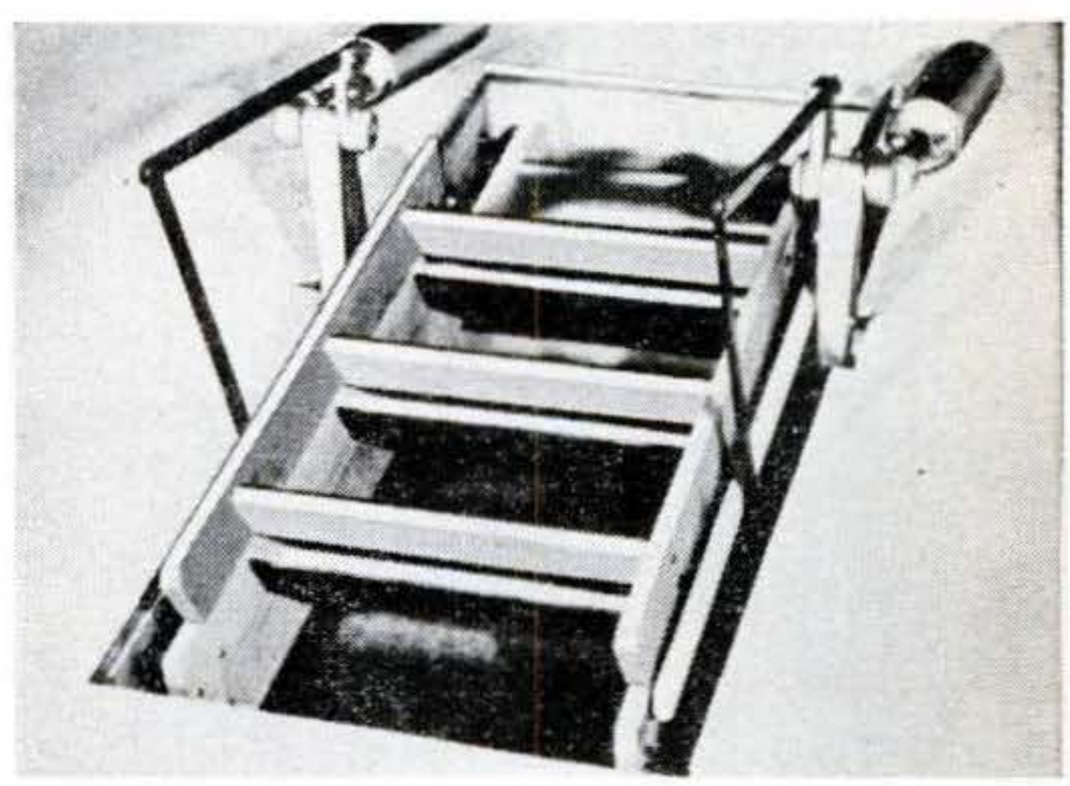
Copyrighted material

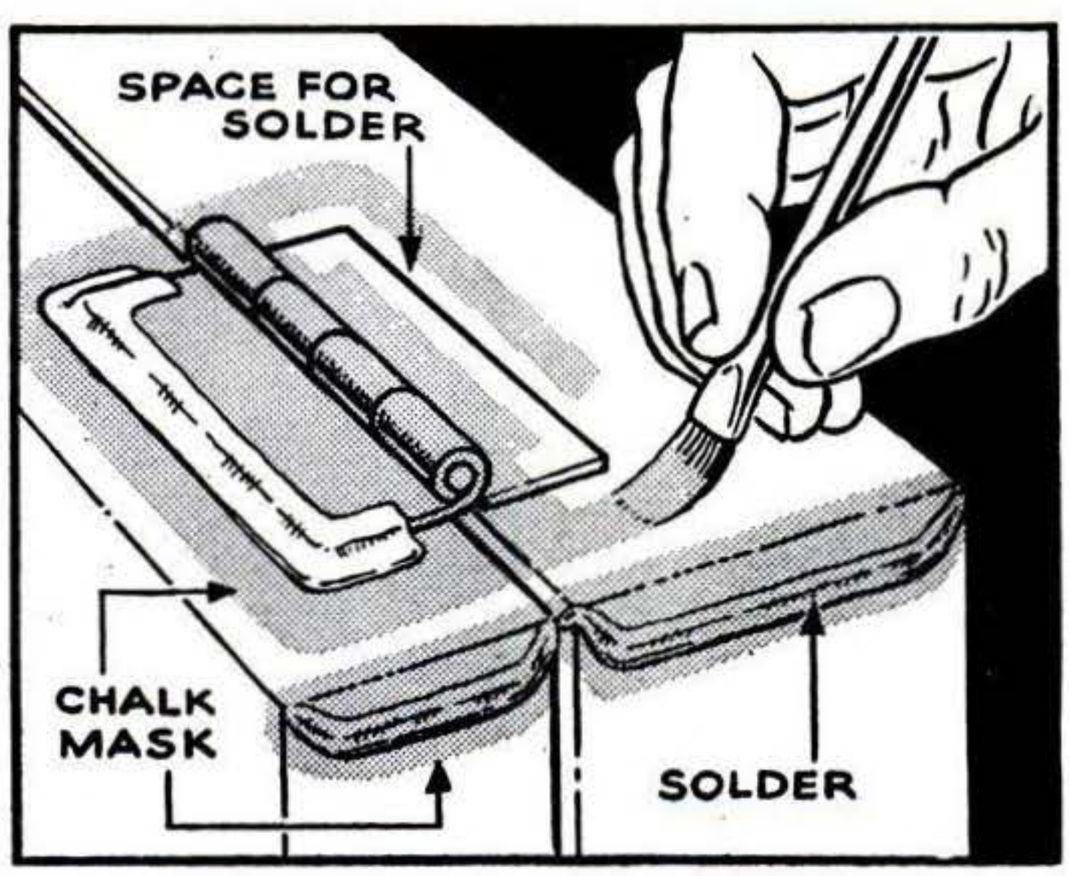


Hidden Stairway Folds Up to Fit Small Opening

MADE in three hinged sections, this attic stairway folds up when not in use. Because of this, it requires an opening only 26″ by 54″ and it lies flat on the attic floor after the trapdoor is closed.

Evenly balanced and actuated by counterweights without springs, the stairway is easily pulled down with a cord, or closed with a gentle upward push. Made of wood, it has brass hinges and aluminum brackets and rocker arms. It's available in two lengths—8′ 9″ and 9′ 9″—from the Precision Parts Corporation, Nashville, Tenn.



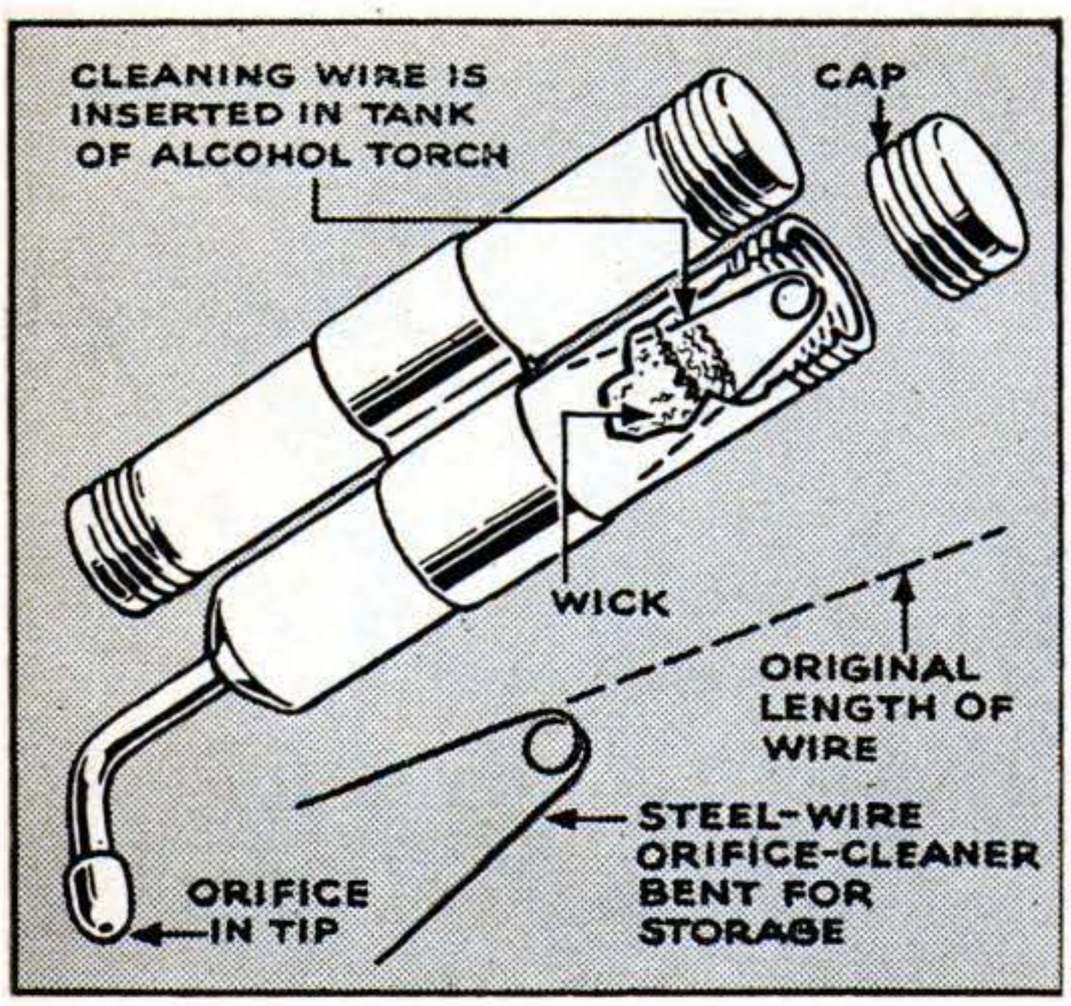


Chalk Used as Soldering Mask

WHILE soldering certain kinds of work—for instance, the hinges and seams of a tin box as illustrated here—you may have noticed that it's difficult to keep solder off areas where you don't want it.

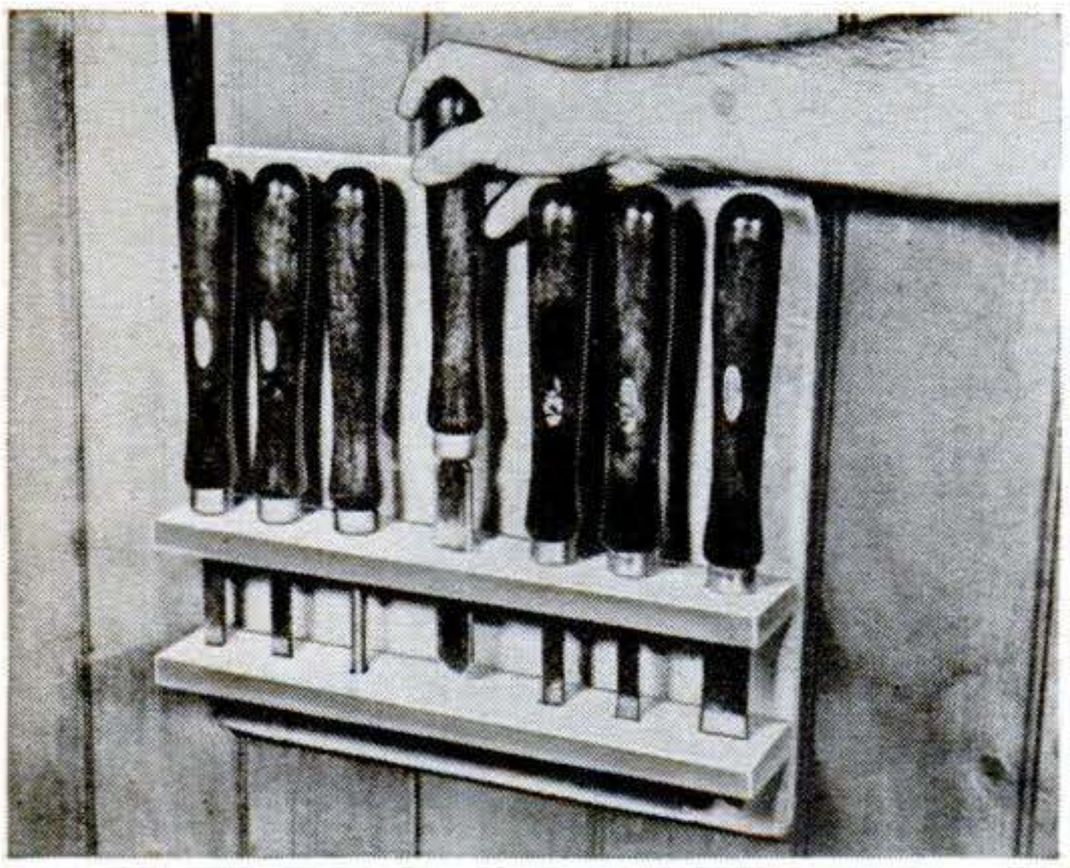
This may be avoided with a chalk mask. Dissolve a stick of chalk in enough water to make a thick paste and apply with a brush around, but not on, the spots you expect to solder. It's best to warm the work first so the paste will dry quickly. When you've finished the job, the chalk may be easily wiped off.—*Andrew Vena, Philadelphia.*

Copyrighted material



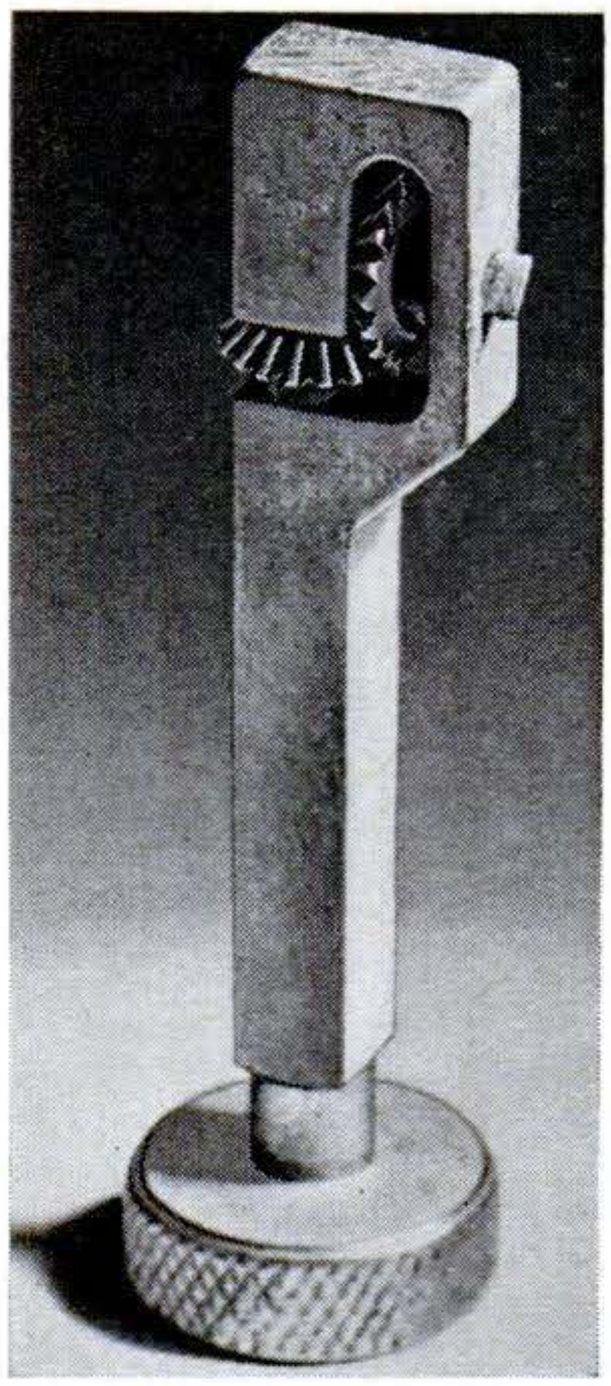
Cleaning Wire Kept in Torch

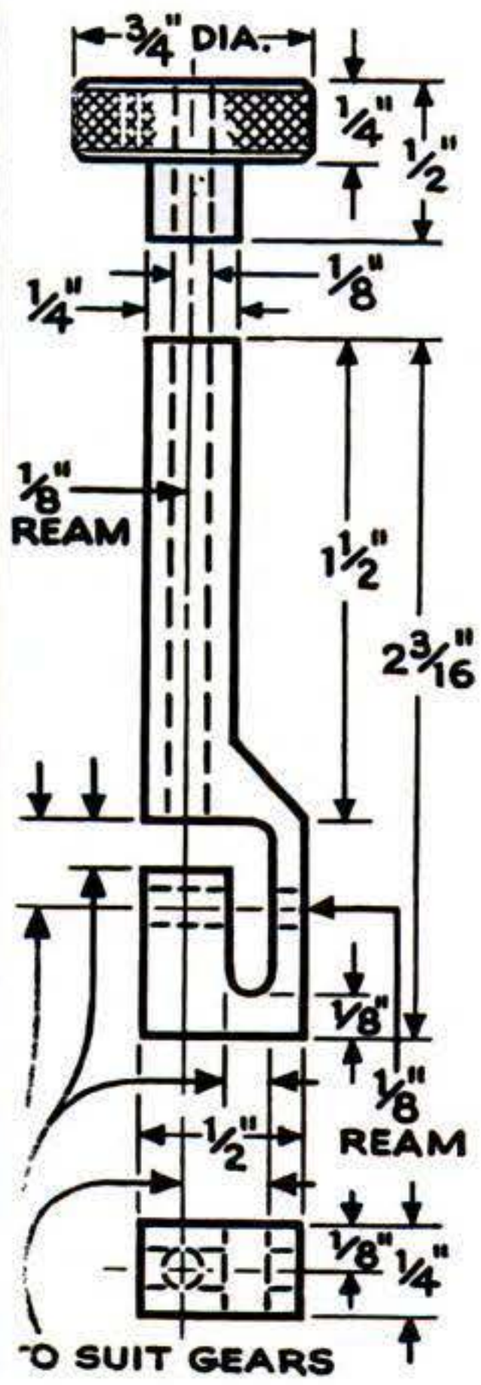
A CLOGGED nozzle can put a pocket alcohol torch out of commission just when you need it. The nozzle orifice is very small and should be cleaned only with the fine steel wire supplied with the torch for that purpose. The problem is to have this wire on hand. I've found it a good idea to bend the straight wire like a hairpin and stick it into the wicking of the small tank, just under the screw cap. Kept there, it's safe, easy to get the very moment you need it, and can't rust.—*Andrew Vena, Philadelphia.*



Chisel Rack Protects Edges

FINE cutting edges of wood-turning or straight chisels are protected if the tools are hung in the double-shelf rack above. The holes in the two shelves are identical, and are bored oversize to permit easy insertion and withdrawal of the chisels. Both shelf members are simply butted against a back, or could be mounted on a wall or cabinet.—*D. J. Bachner, Jackson Heights, N. Y.*





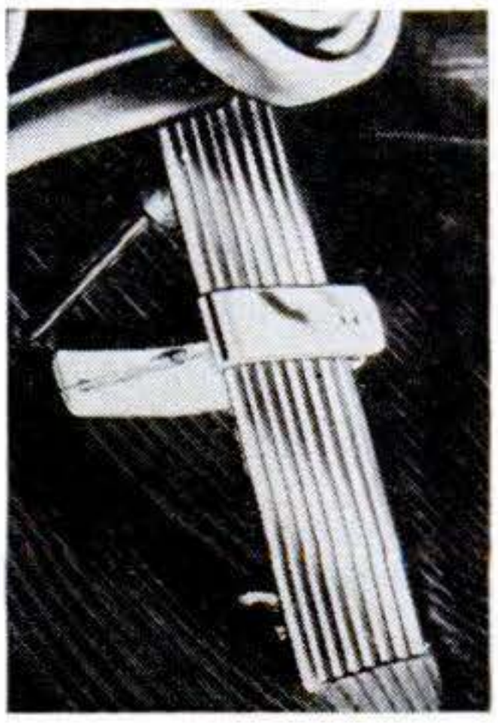
Gears Work Offset Screwdriver

DURING the war this simple tool gave good service at a plant turning out important military equipment. Not only will it drive screws in tight quarters, but if fitted with a countersink, it'll also deburr holes you couldn't reach with an ordinary drill.

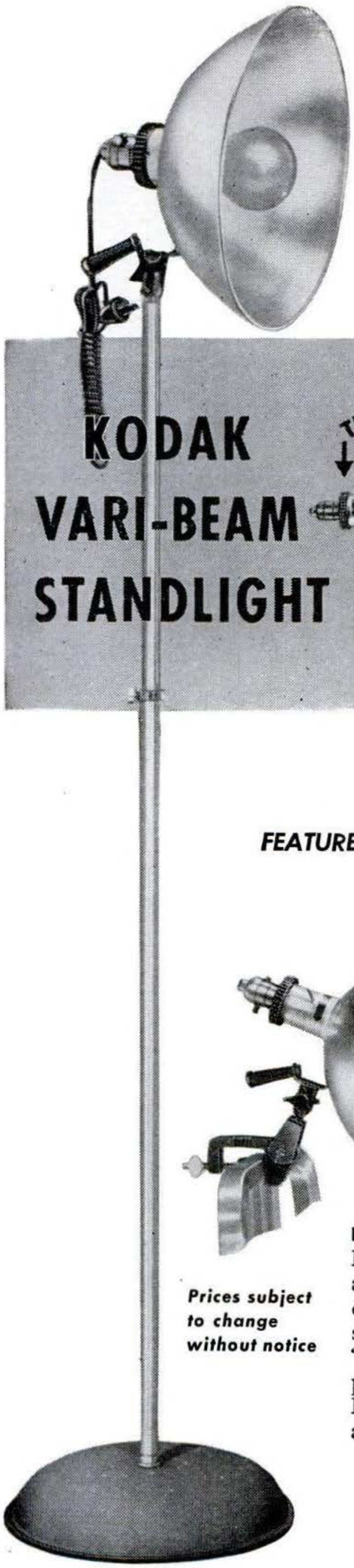
Select the gears first and build the gadget around them. The dimensions shown were for ⅜" miter gears ⅛" thick. Square up one side and end of a piece of bar steel or dural. Locate the shaft holes and gear slots from these trued sides. Be careful to drill the holes at right angles. Drill both shafts for pins to lock on the gears, and shape the short one to a screwdriver bit. Harden it for greater durability.—*Edward J. Carey, Brooklyn, N. Y.*

Spring Limits Speed of Car

INSTALLED on the accelerator, a spring clip made by Speed-Minder Laboratories, Chicago, resists foot pressure at a predetermined speed, reminding the driver to stay in that limit. Adjustable for various speeds, it allows full throttle in emergency.

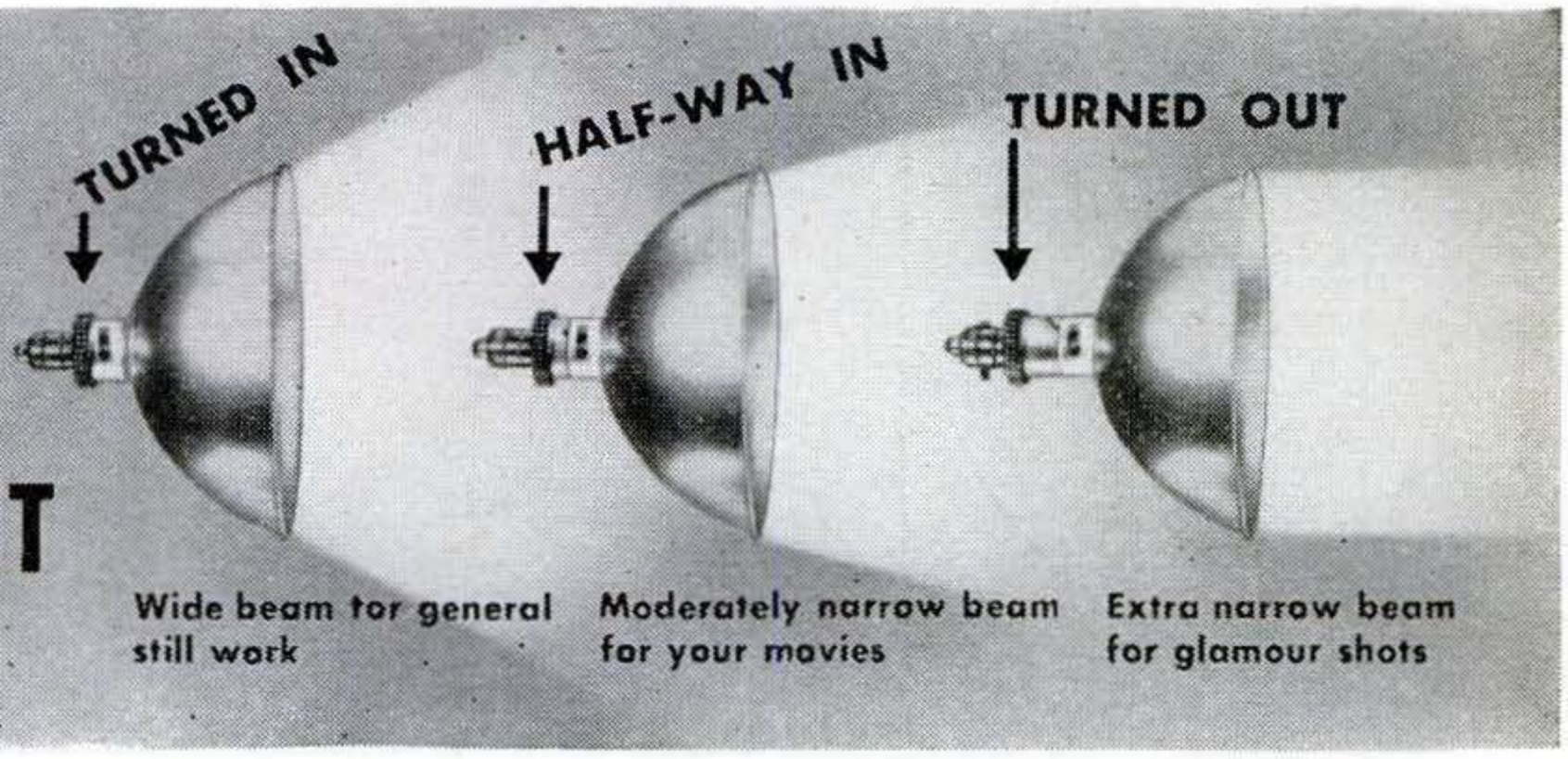


Copyrighted material



PUT SNAP AND SPARKLE IN YOUR NIGHTTIME PICTURES

KODAK VARI-BEAM STANDLIGHT



FEATURES

12-INCH REFLECTOR . . . with No. 2 Photoflood lamp, gives powerful illumination.

FIRM STEEL BASE . . . 4½ pounds, has special rubber rim for protecting furniture and floors.

TELESCOPIC COLUMN . . . easy to adjust lamp for any height from 3 to 5½ feet.

CONVENIENT HANDLE FOR AIMING LAMP . . . clamping knob quickly adjusts tension.

Price—$15

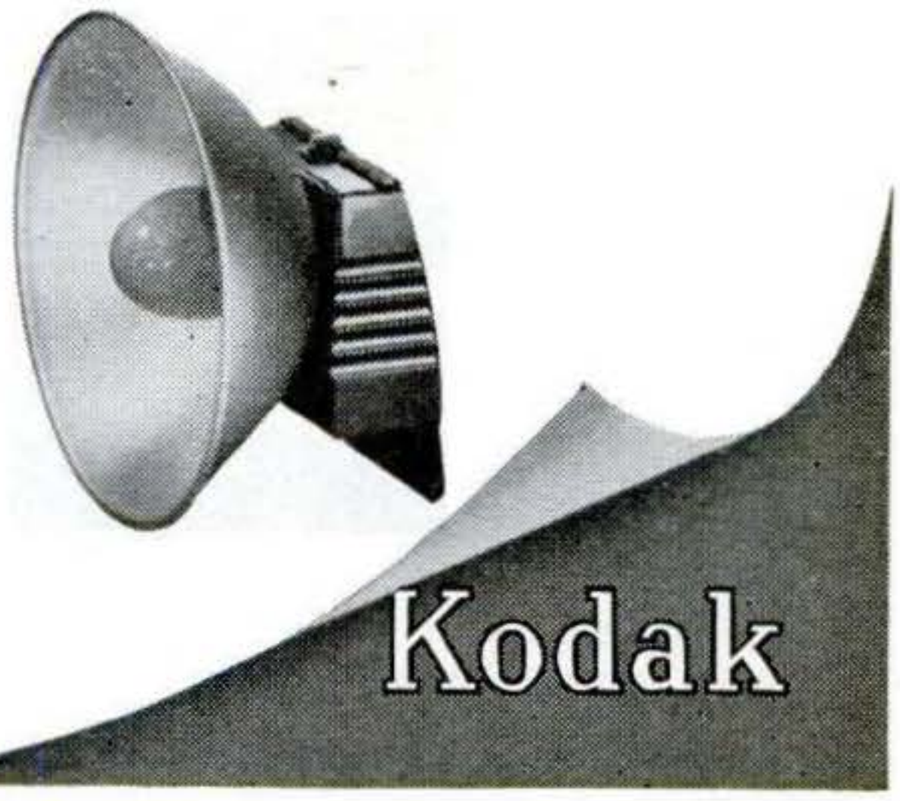
KODAK VARI-BEAM CLAMPLIGHT—
Lamp unit has all the features of the Vari-Beam Standlight unit, but is mounted on flexible bracket. Padded clamp attaches quickly and securely to chair backs, table tops, and tubular surfaces.

Price—**$9.75**

Prices subject to change without notice

KODAK PHOTO FLASHER—
Brilliant indoor flash pictures are easy to take with this self-contained unit. Specially designed for any camera with "time" or "bulb" setting. Simply open shutter . . . shoot the Flasher . . . close the shutter, and you have the picture.

Price—**$1.25** *(plus tax)*



"Kodak" is a trade-mark

EASTMAN KODAK CO.
ROCHESTER 4, N. Y.

Copyrighted material

At Last! THE POWER

SHOP SMITH

REG. TRADE MARK

Complete five-tool unit

$159.50

...with special ½ H.P. ball bearing motor $195.50

BUILT RUGGED

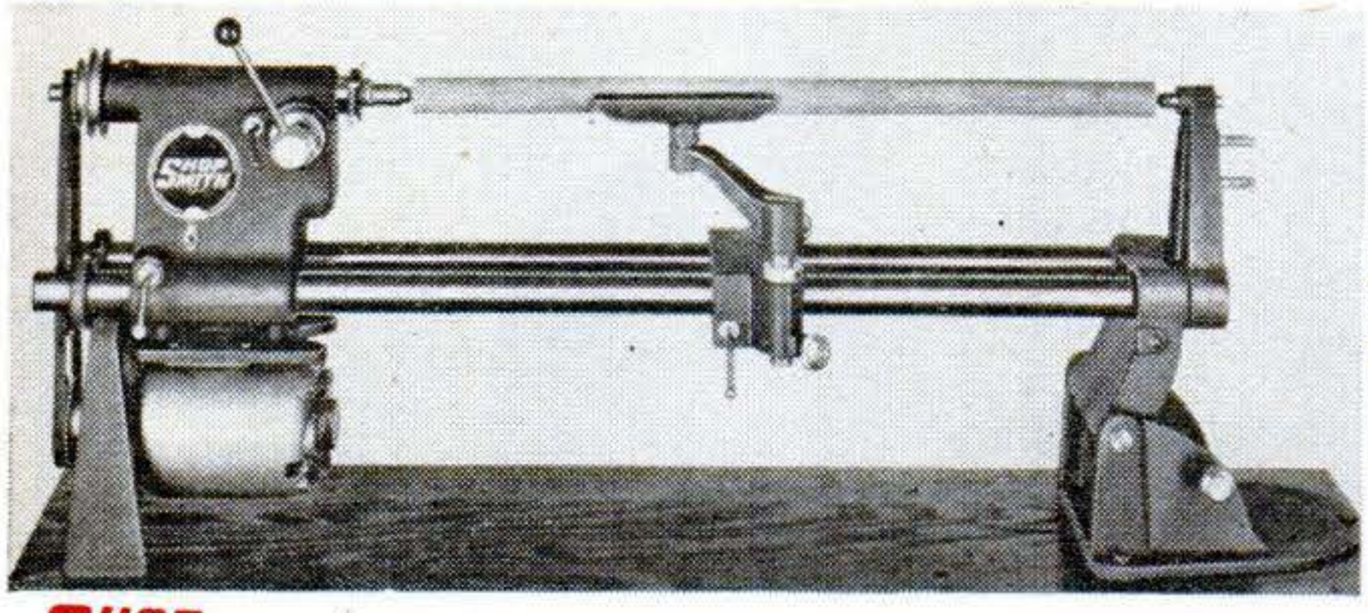
with cast iron headstock and carriage. Centerless ground and polished steel ways. Heavily-ribbed aluminum table. Four life-long grease-sealed Fafnir ball bearings. Unit weighs over 200 pounds. Will last a lifetime.

SHOP SMITH AS A CIRCULAR SAW

Has maximum distance of 46″ between saw blade and fence. Tilts to any angle—positive lock. New principle provides micro-adjustment of distance between fence and saw blade.

Specifications: Saw Blade: 8″ Dia. Depth of cut: 2¼″. Table: 14½″ x 17″; with extension, 54″ x 17″.

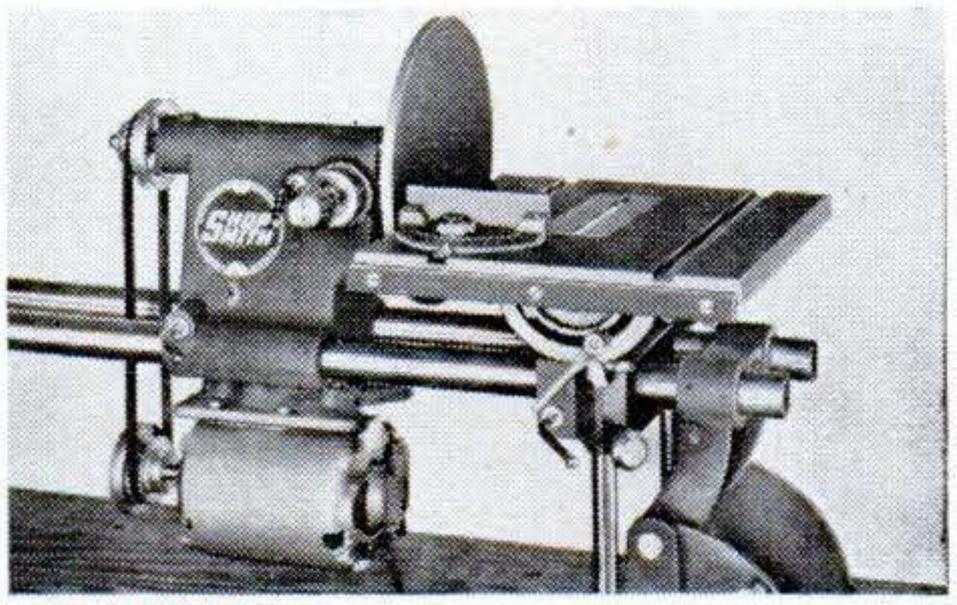
Standard Equipment: 8″ saw blade and arbor. Table extension. Mitre gauge. Rip fence. Saw guard.



SHOP SMITH AS A LATHE

34″ between centers. Swing: 15″. Variable speeds. Quill Feed: 4½″.

Standard Equipment: Tool rest. Drive center. Dead center.



SHOP SMITH AS A DISC SANDER

Disc Diameter: 12″. Table Dimensions: 14½″ x 17″. Tilting Table.

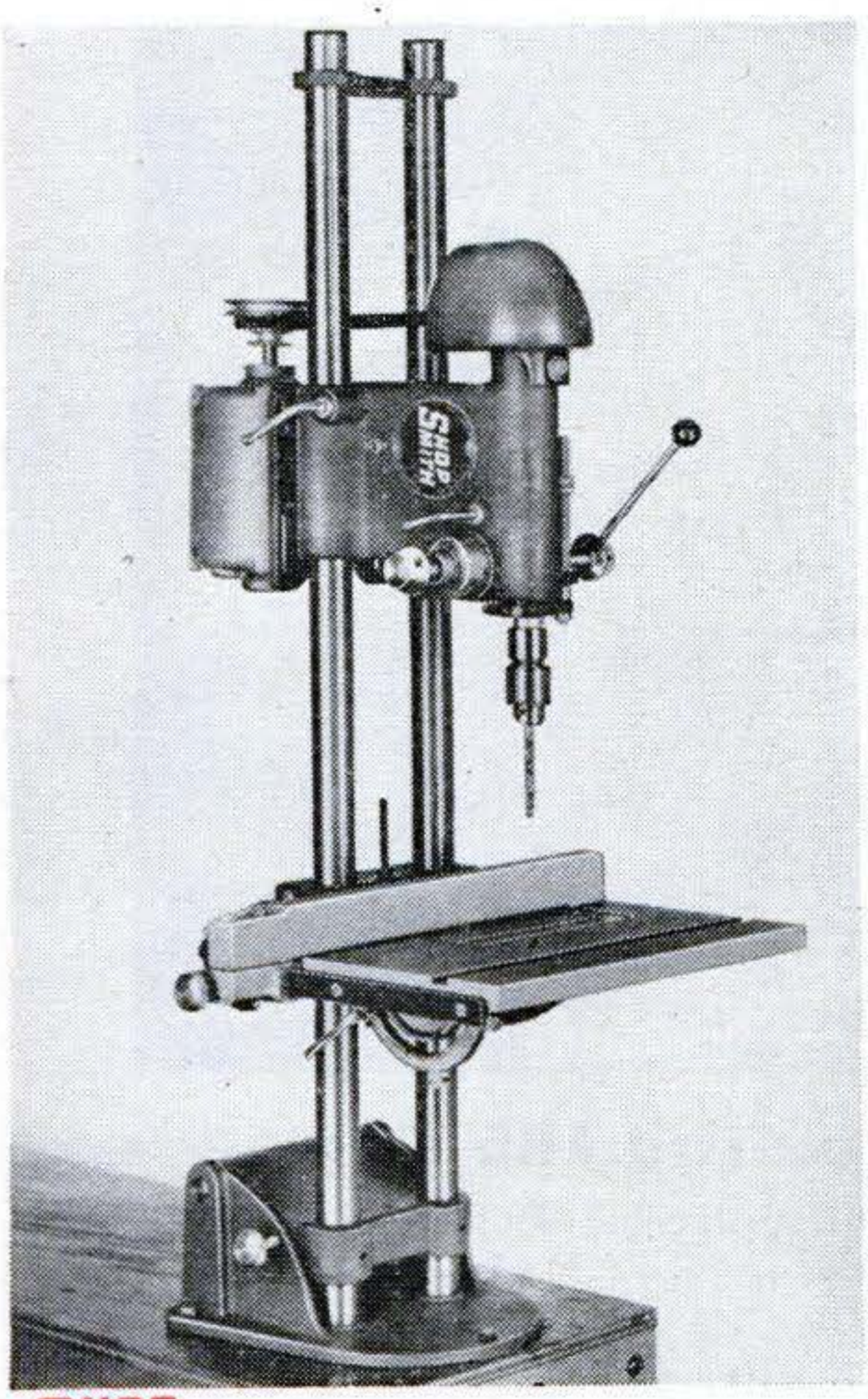
Standard Equipment: 12″ disc. Mitre gauge.

Copyrighted material

TOOL YOU'VE ALWAYS WANTED

CIRCULAR SAW • DRILL PRESS VERTICAL AND HORIZONTAL
WOOD LATHE • DISC SANDER

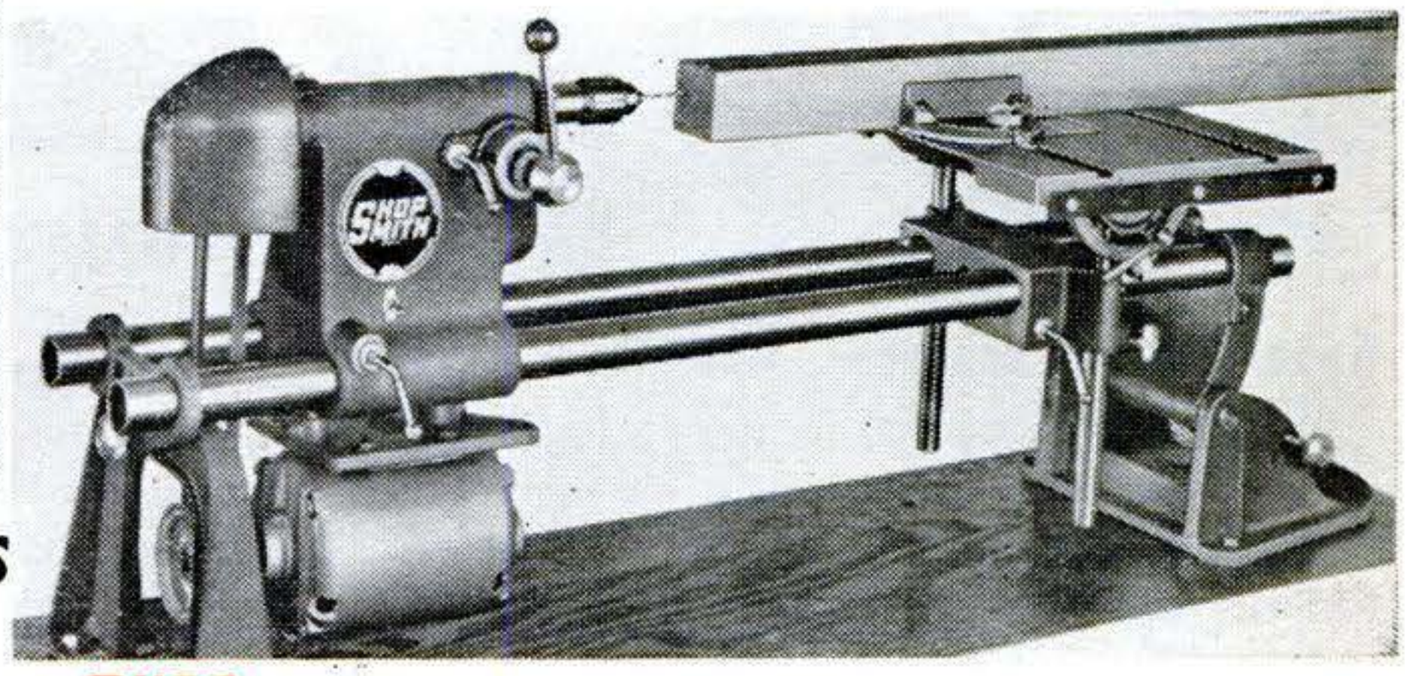
Five Sturdy Tools...each better than a single-purpose tool—engineered into one compact unit. Thousands already in use. Is rugged enough to last a lifetime. And priced so you can afford it



SHOPSMITH — built for man-size work — is no toy. Compact (59″ long by 21″ wide by 18″ high). Shopsmith weighs over 200 pounds. There's an *8″ combination circular saw* that cuts 2¼″ deep . . . *big capacity lathe* with 15″ swing . . . accurate *12″ disc sander* . . . *horizontal drill press* with no limit to work length . . . *vertical drill press* with ½″ capacity Jacobs key chuck. Shopsmith also excels as grinder, buffer, drum sander, router. And you can change from tool to tool in less than one minute!

Demand, of course, is ahead of production. But Shopsmith will soon be available to the thousands of craftsmen who have long demanded a compact, sturdy multi-purpose power tool. Your wait will be rewarded. Magna Engineering Corporation, 465 California St., San Francisco 4.

SHOP SMITH REG. TRADE MARK



SHOP SMITH AS A VERTICAL DRILL PRESS

Capacity: Drills to center of 15″ circle. Clearance: Table to chuck—27″ max. Spindle: ⅝″ Dia., 6 spline, hardened tip. Spindle Feed: 4½″. 4 grease-sealed Fafnir ball bearings. Variable speeds. Table: 14½″ x 17″.

Standard Equipment: ½″ Jacobs key chuck. Fence.

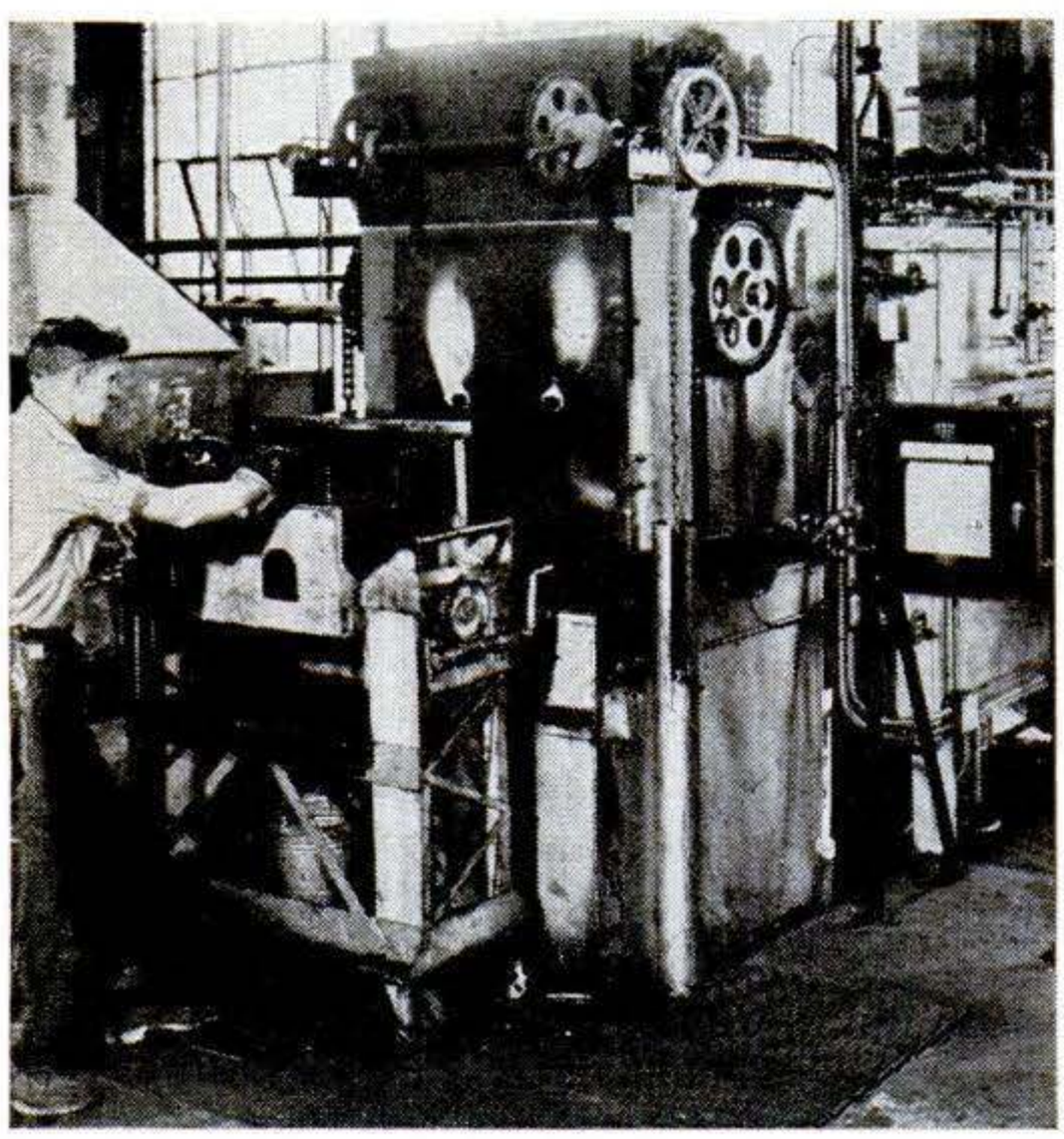
SHOP SMITH AS A HORIZONTAL DRILL PRESS

Only Shopsmith performs this highly useful function. No limit to length of work. Provides accurate method of drilling for doweling, etc.

Copyrighted material

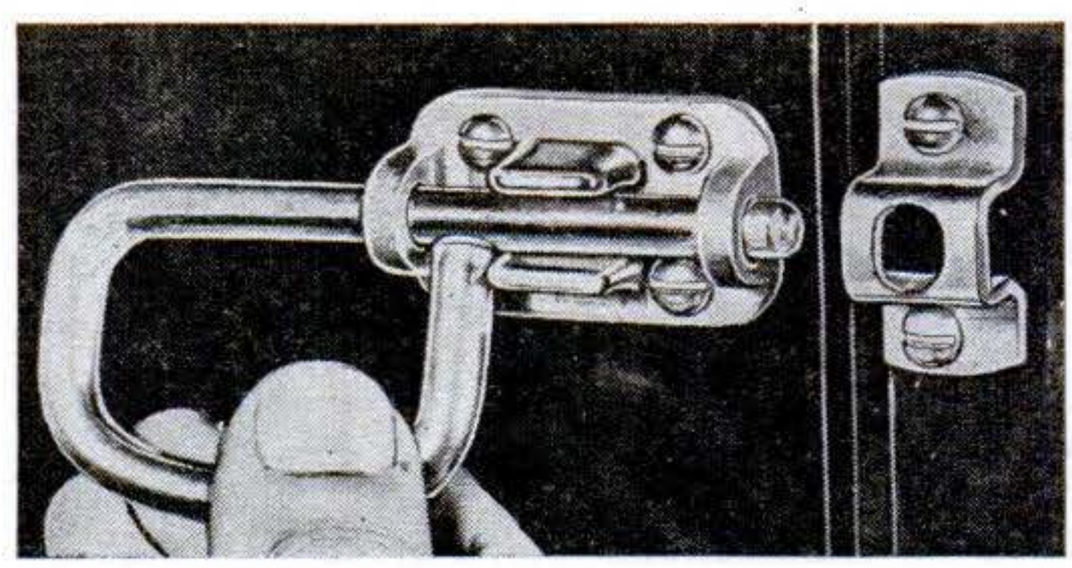
Waste Whisked Away

THIS San-i-Way Ⓣ waste container holds a disposable, water-repellent, waxed-paper bag in a steel framework. Toe pressure on a pedal opens the bag for receiving garbage, or releases it for removal. It is made by LeRoy Products, of Ypsilanti, Mich.



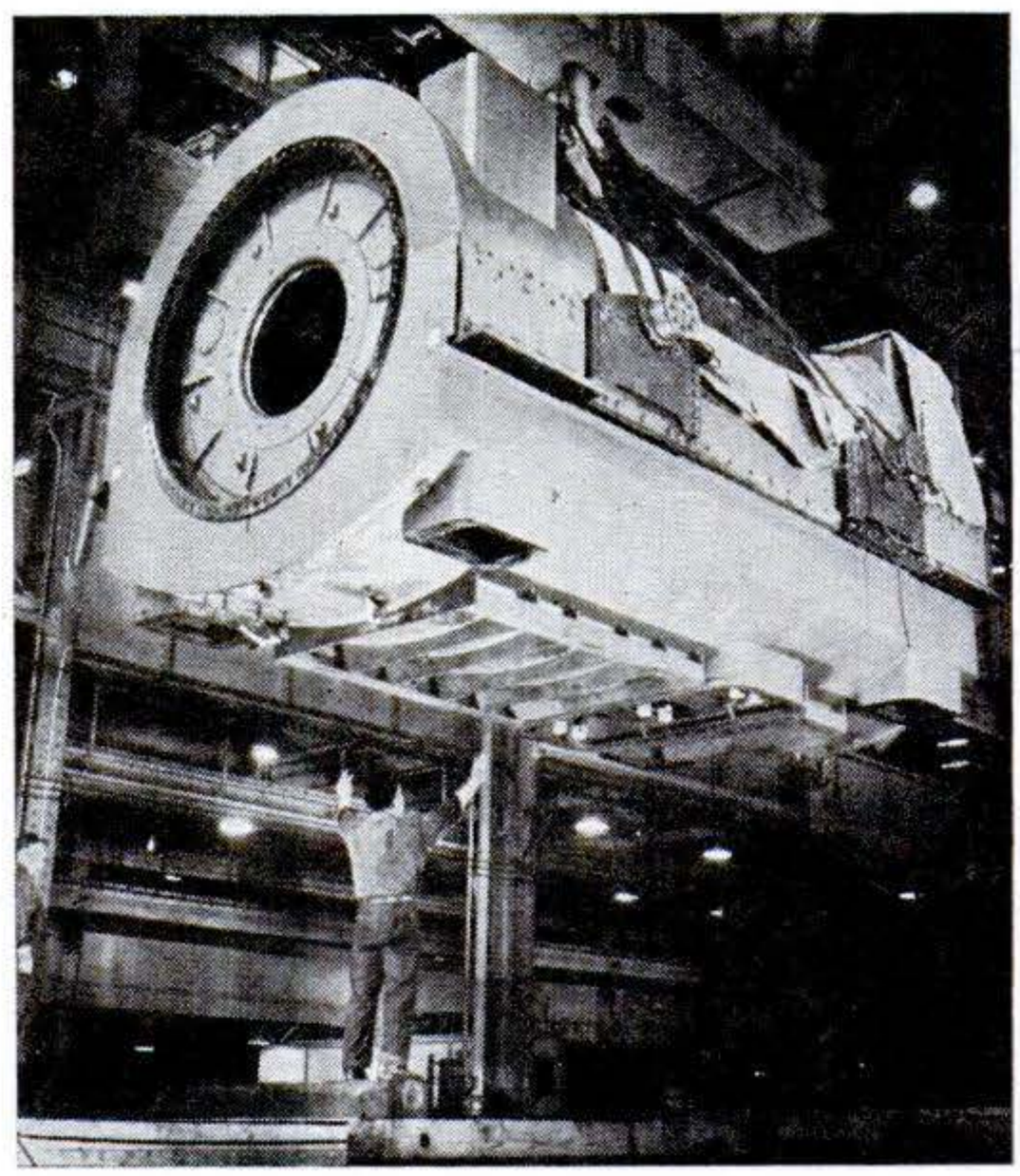
Gas Hardens Auto Parts

A "DRY CYANIDE" treatment of small auto parts, replacing liquid cyanide salt baths, gives the parts longer life. Shown above is the dry-cyanide-gas furnace at GM's Oldsmobile Division. Small parts, such as brake-lever pawls and shift levers, are case-hardened at between 1,475° and 1,550° F. and exposed to the gas. An oil bath follows.



New Latch Is Safer

THE weight of the latch handle of the new door and window bolt lock shown above makes it fall automatically into a fixed and locked position at all times. The manufacturer, Hall Industries, of Chicago, Ill., claims that this feature makes their Handle-Latch Ⓣ practically jimmyproof. The hole in the center of the bolt receiver makes it possible to attach the device in two positions: either in the regular way as illustrated here, or turned facing the bolt, with the hole as the bolt receiver.



Railroading 185 Tons

THE heaviest piece of electrical equipment ever shipped out of a GE plant, the external generator case, shown above being loaded on a special flatcar, weighs 369,500 lb. It is part of a turbine-generator set that will produce enough power for a city of 200,000. To clear a bridge at one point en route to its New Jersey destination, railroad tracks had to be sunk five inches. A normal two-day trip took six days.

Copyrighted material

NOW... LIGHT WHEN YOU NEED IT!

Ray·O·Vac LEAK PROOF batteries stay fresh for years!

(because they're sealed in steel!)

© 1948 BY RAY-O-VAC COMPANY, MADISON, WIS. RAY-O-VAC (LIMITED) CANADA, WINNIPEG, MAN.

Foiled—these tricky power thieves,
Causing all your flashlight peeves.

Modern, steel-sealed Ray-O-Vacs
Stop these gremlins in their tracks.

Power's locked in, and that is why
Spares stay fresh. How's *your* supply?

Guarantee: If your flashlight is damaged by corrosion, leakage, or swelling of this battery, send it to us with the batteries and we will give you FREE a new comparable flashlight with batteries.

Ask for Ray-O-Vac Leak Proofs

Buy Spares... *they stay fresh*

Copyrighted material

Deep or shallow? Crisp or damp? Falling straight down or angling in at 80 miles an hour?

No joke! The Army Signal Corps has push-button weather the whole year round — and right at Fort Monmouth, New Jersey!

These versatile Army weathermen don't stop at mere blizzards. In their new equipment torture-chamber, they can yank the temperature down to an unearthly 100 degrees below zero or boost it to a broiling 190 degrees above. They can make rain like a Rangoon monsoon, hail like cherrystones, fog like London's, hurricanes and typhoons and desert dust storms like nothing civilized man has ever seen!

Here's the recipe for snow. In a chamber the size of a 4-room house, they yank the temperature down to minus 40 with huge ammonia compressors powered electrically with 700 horsepower. Then they shoot in saturated steam which quickly turns to fog and drops to the freezing point where it forms a super-cooled cloud. At 5 or 10 degrees above zero, Signal Corps engineers induce nucleation by shaking a thimble-size bag of dry ice. When the cloud gets down to minus 40, the water vapor crystallizes into billions of snow crystals which fall to the floor or can be blown about with a high-speed propeller.

In a single week, military equipment can be tested in every conceivable kind of weather — testing which otherwise would take many years and millions of dollars to accomplish.

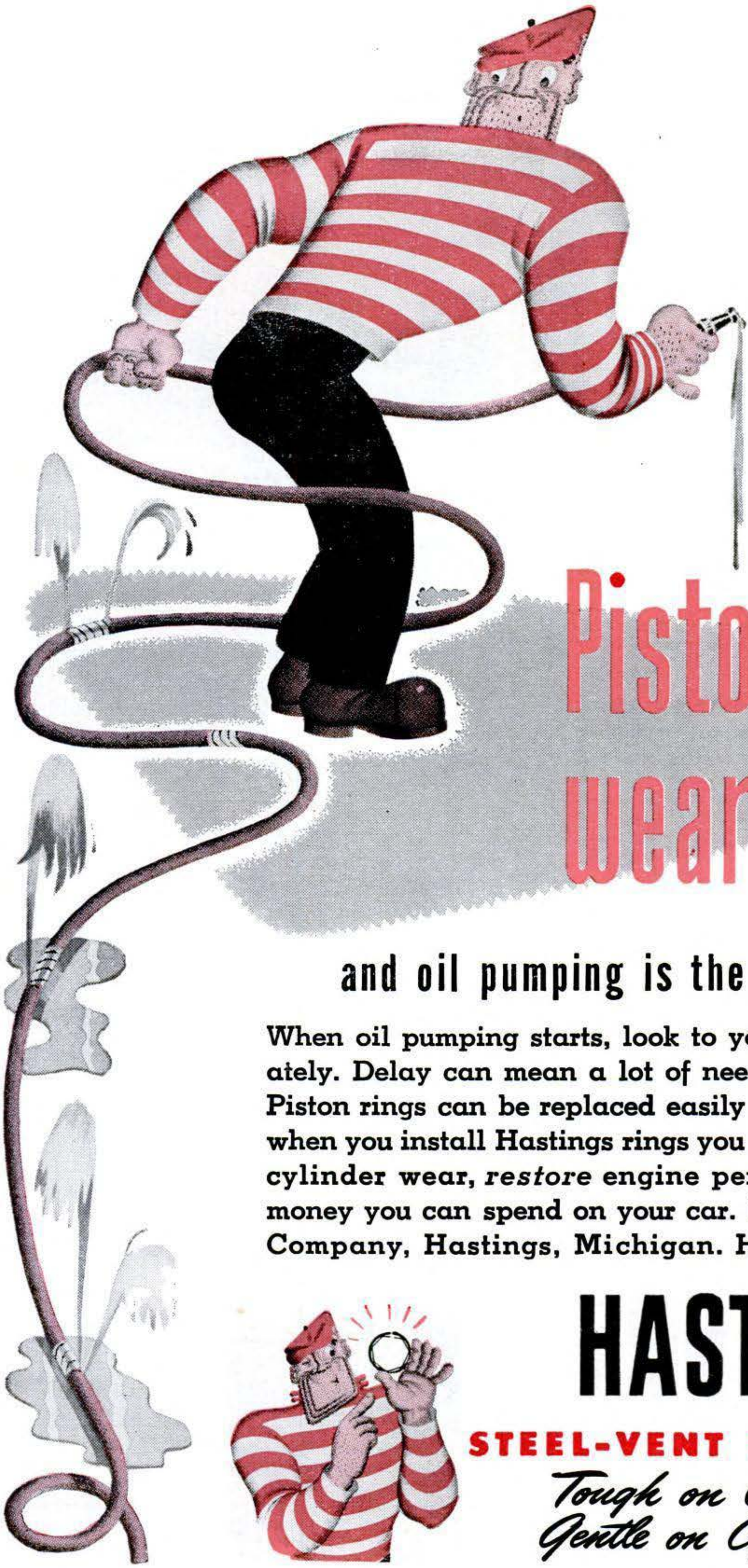
Do you like this sort of forward-looking achievement? Nowhere is science getting a bigger run for its money than in the technical services of the U. S. Army. The ambitious young scientist has his choice of technical schools galore! If you are 17 to 34, ask your nearest Recruiting Officer if you measure up to the Army's high standards.

CAREERS WITH A FUTURE

U. S. Army and U. S. Air Force

U. S. ARMY AND U. S. AIR FORCE RECRUITING SERVICE

Copyrighted material



Piston Rings wear out, too

and oil pumping is the first symptom

When oil pumping starts, look to your piston rings immediately. Delay can mean a lot of needless grief and expense. Piston rings can be replaced easily and inexpensively. And when you install Hastings rings you *stop* oil pumping, *check* cylinder wear, *restore* engine performance. It's the best money you can spend on your car. Hastings Manufacturing Company, Hastings, Michigan. Hastings Ltd., Toronto.

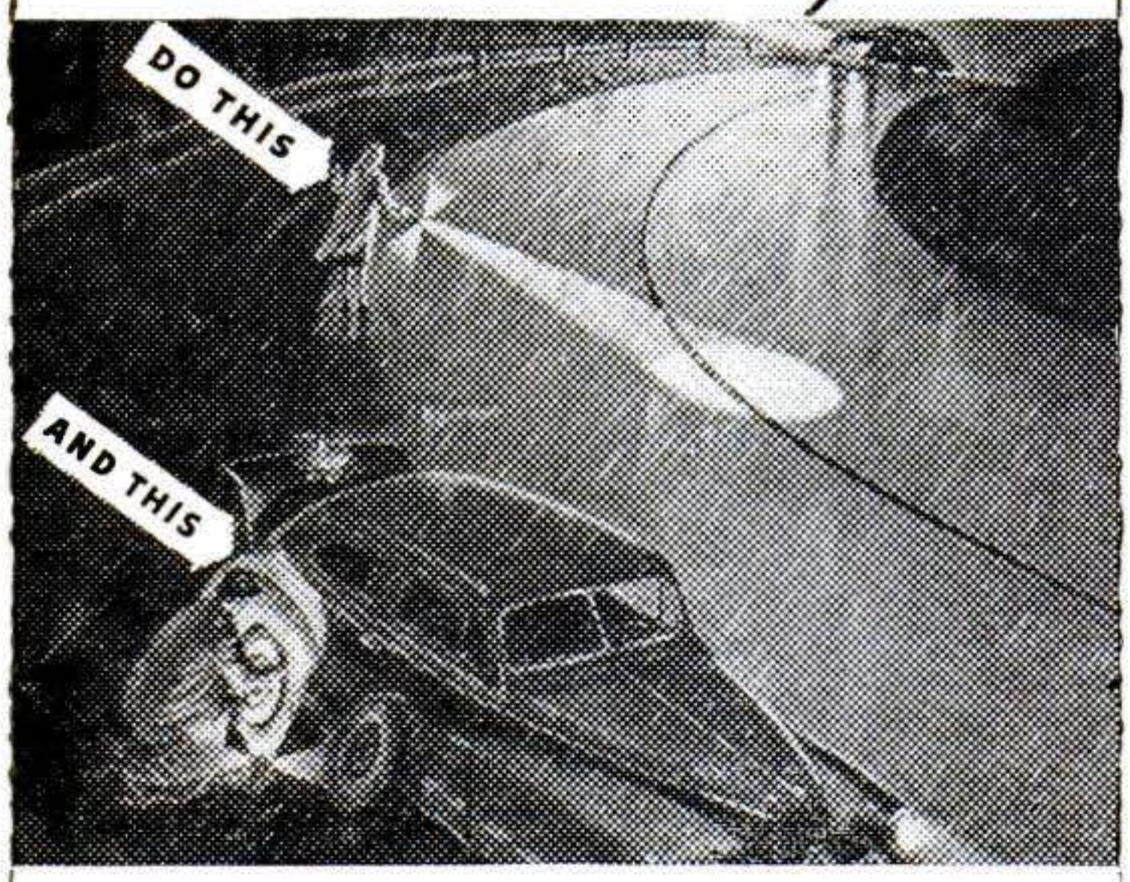
HASTINGS

STEEL-VENT PISTON RINGS

Tough on Oil Pumping
Gentle on Cylinder Walls

Copyrighted material

If a "flat" anchors you just over the hill... tonight



Send your wife back to the crest of the hill to flash a warning signal. Equipped with a WINCHESTER . . . the dual-purpose light that throws *both red and white* light rays . . . she can warn approaching cars. Then, in safety, you can change wheels with the aid of the brilliant light from your second WINCHESTER flashlight.

IF ALONE, PUT RED-WARNING LIGHT ON HIGHWAY 50 YARDS TO REAR OF YOUR CAR

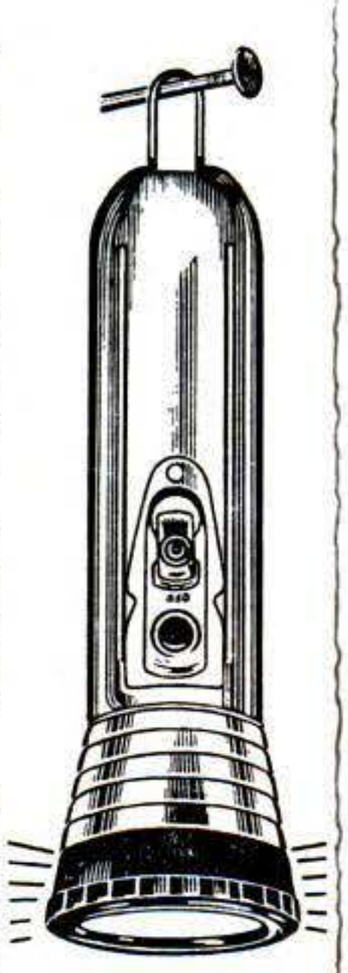
Play safe. $3.10, the price of these 2 WINCHESTER flashlights complete with batteries, is inexpensive "life protection" for you, your wife and other travelers.

WINCHESTER **BATTERIES**
TRADE-MARK

Last almost TWICE as Long!

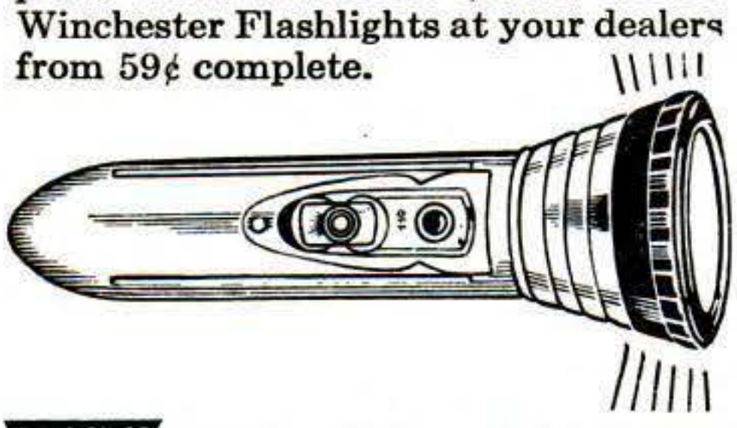
Still cost only a dime. *But, measured by A. S. A. light industrial flashlight test, the Winchester No. 1511 flashlight battery now LASTS ALMOST TWICE as long as previously. Reason? Research found a way to step up the power of the light-making chemicals.

Use them not only in flashlights but also for *any* equipment using regular flashlight-cell size batteries. Winchester Repeating Arms Company, New Haven, Connecticut, Division of Olin Industries, Inc.



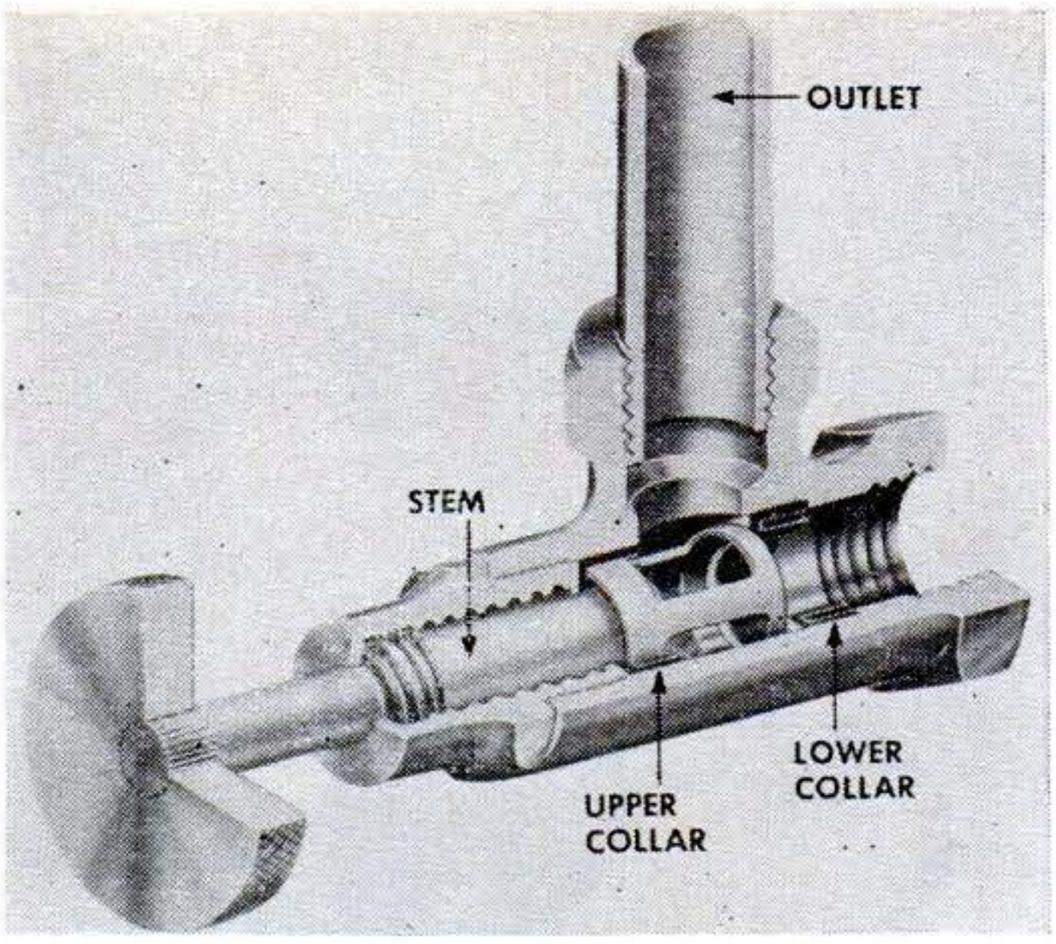
(Right) No. 6410 Winchester with hanger; complete with batteries, $1.65.

(Below) No. 4510 Winchester, complete with batteries $1.45. Other Winchester Flashlights at your dealers from 59¢ complete.



DIVISION OF OLIN INDUSTRIES INC.

WINCHESTER
TRADE-MARK
FLASHLIGHTS AND BATTERIES



Trouble-Free Valve

THE valve seat, washers, and all wearing parts—main sources of trouble in valves—have been eliminated in this new valve. Developed by Knowles-Fisher Corp., it opens and closes with a flick of the finger, and is both jamproof and leakproof. When opened, a highly polished stem is withdrawn from the lower to the upper of two synthetic rubber collars. As pressure builds up gradually, operation is smooth and almost noiseless.

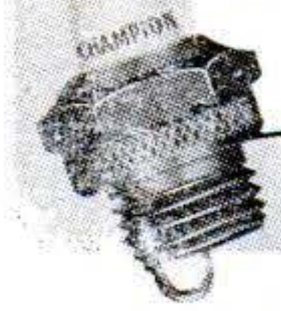
No Shortage of Salt

SIX POUNDS of salt seasons all the food an average American can eat in a year, yet enough salt is produced to supply every person in the world with 40 pounds.

Cooling Hot Miners

IT GETS so hot below the earth's surface (the temperature increases 16° F. every 1,000 feet underground) that the world's deepest gold mine, in Robinson Deep, South Africa, had to be air-conditioned to prevent cremation of the miners.

Model Builders *Attention!*



Actual Size V-Plug

	V	V-2	V-3
Hex	1/2"	3/8"	5/16"
Thread	3/8"-24	1/4"-32	1/4"-32
Thread Length	7/32	7/32	5/32
Weight, Grams	8	3 1/2	2 1/2

Champion Spark Plugs for model gas engines give the same dependable performance as regular Champions. Champion Ceramic insulation—Sillment sealed. Alloy needlepoint electrodes for easy starting. One piece construction.

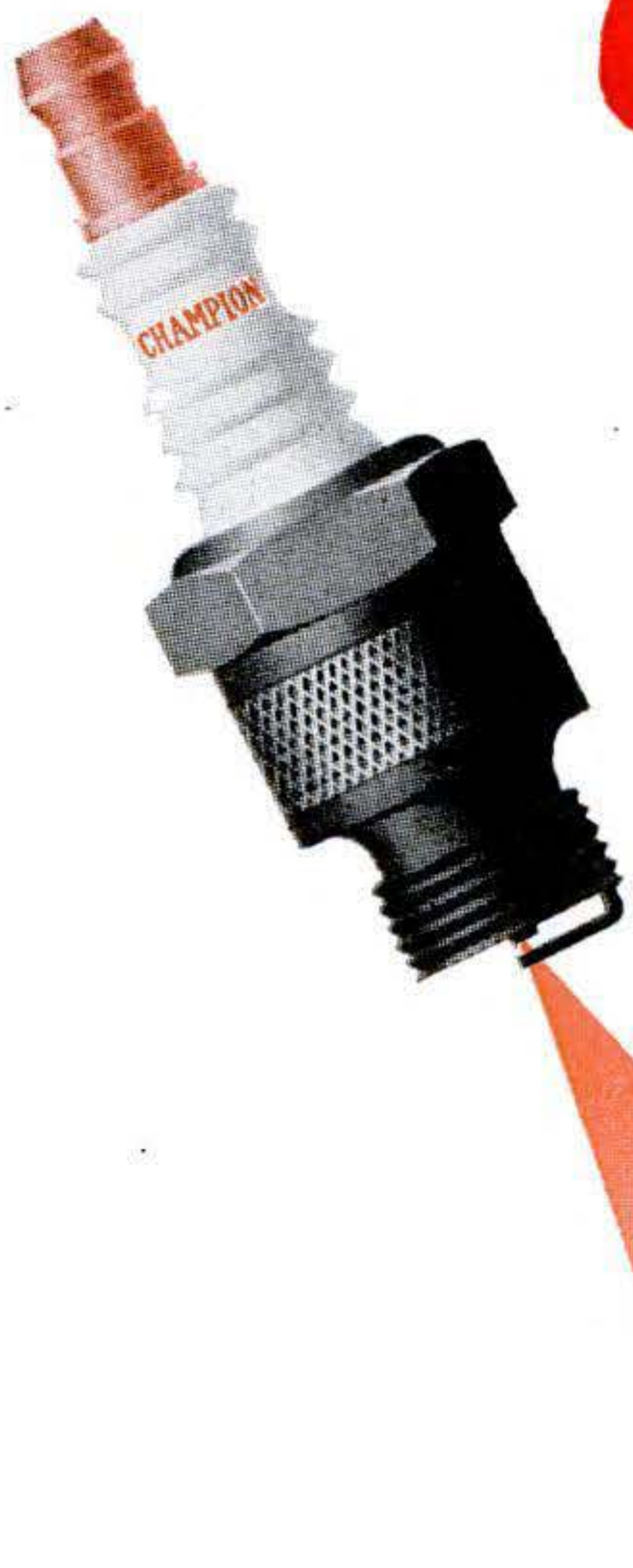
CHAMPION
SPARK PLUG COMPANY • TOLEDO 1, OHIO

Copyrighted material

Dependable

CHAMPION

America's Favorite Spark Plug



Keep your eye on the track!
Most racing drivers use Champion Spark Plugs because they have found that they insure better, more dependable engine performance. Most motorists have likewise found this to be true—and have made Champion America's Favorite Spark Plug
—for every engine!

CHAMPION SPARK PLUG COMPANY, TOLEDO 1, OHIO

FOLLOW THE EXPERTS

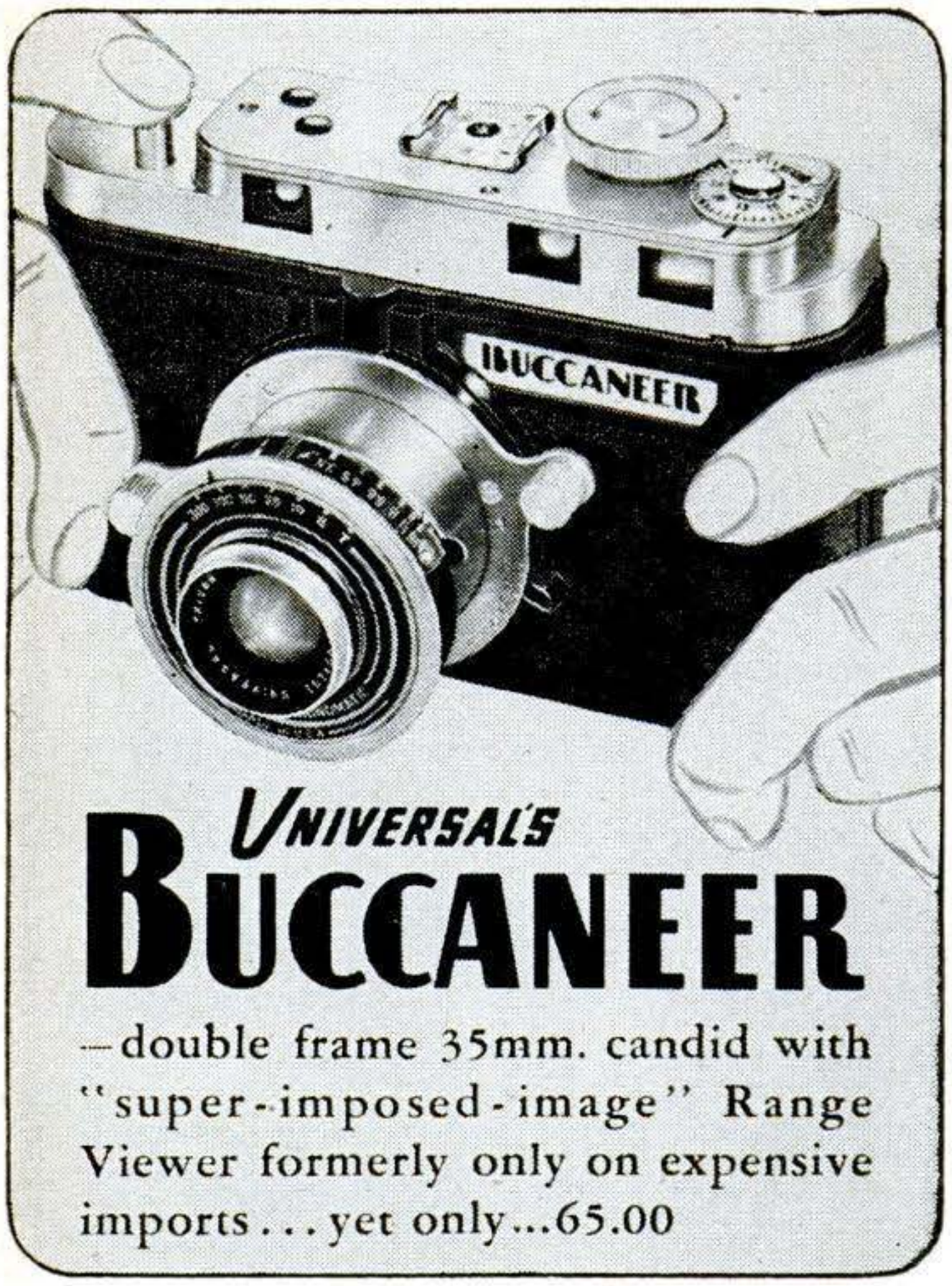
DEMAND NEW DEPENDABLE CHAMPIONS FOR YOUR CAR

Listen to the CHAMPION ROLL CALL . . . Harry Wismer's fast sportscast every Friday night, over the ABC network

Copyrighted material

ISN'T IT A HONEY!

.... with the "super-imposed-image" Range Viewer



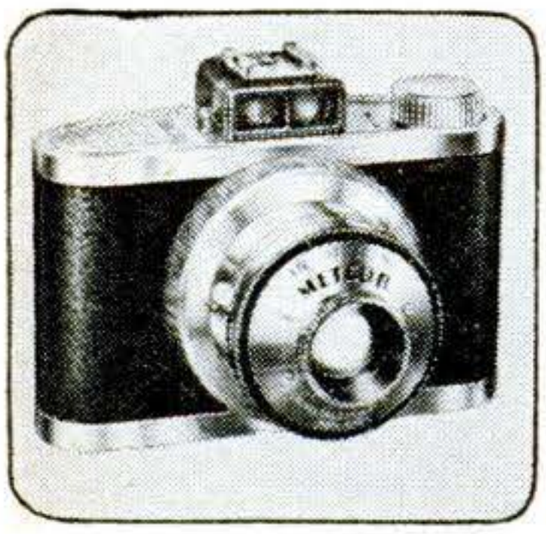
UNIVERSAL'S
BUCCANEER
—double frame 35mm. candid with "super-imposed-image" Range Viewer formerly only on expensive imports . . . yet only ...65.00

IT sure IS a honey . . . this Universal Buccaneer: The slick, double quick Range Viewer finds your range and composes your picture in a single look.

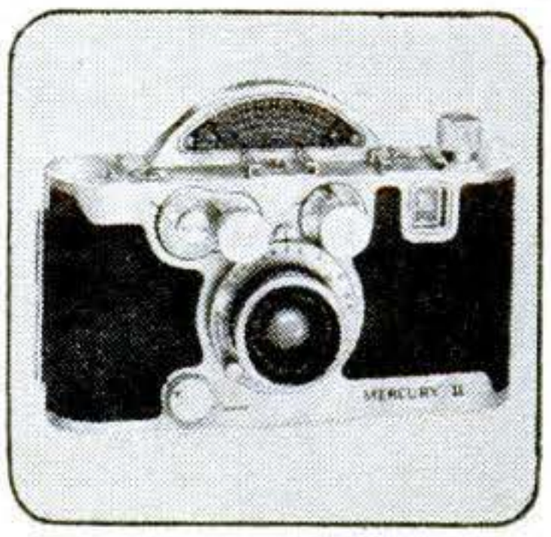
It goes into split-second action . . . takes "out of this world" color shots, indoors or out; brilliant black and white on dull days or bright. Its shutter release automatically locks against double exposures. No more wasted film or picture disappointments.

It's only the Buccaneer that combines all these features: coated f3.5 lens for all-purpose use; built-in flash synchronizer . . . versatile shutter speeds: 1/10th to 1/300th, time and bulb; built-in extinction type exposure meter with calculator. See Universal's Buccaneer—the camera that experts endorse.

UNIVERSAL CAMERA CORPORATION
New York, Chicago, Hollywood



UNIVERSAL'S **METEOR**
The economy candid with 15 "professional" features! Coated lens, synchronized flash unit, variable aperture 15.00



UNIVERSAL'S **MERCURY II**
"The greatest candid for color." 35 mm. single frame. Extreme depth of focus, coated f2.7 lens, speeds to 1/1000th sec. 82.90

For Pictures that *Click*... click a UNIVERSAL

x-acto*

HANDICRAFT KNIVES & TOOLS

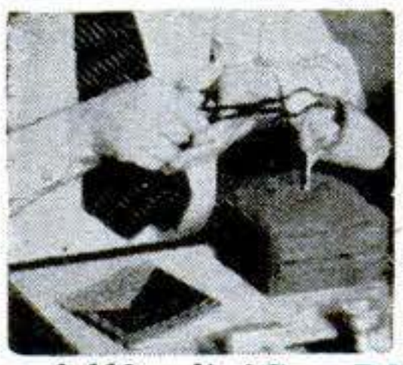
Choice of experts in every art and craft field. A blade for every purpose—quickly interchangeable. Singly and in sets, **50¢** to **$50.00.**
(Slightly higher in Canada.)

Buy where you see this sign—
At hobby, hardware, gift and dept. stores.

X-acto Crescent Products Co., Inc., N. Y.
In Canada, Handicraft Tools, Ltd., Toronto
*Reg. U.S. Pat. Off.

Sand Casting—Forging—Heat Treating—Case Hardening

BRONZE FOUNDRY



In your own workshop allows you to design and build your own GASOLINE ENGINES, STEAM ENGINES, STATUARY, ART OBJECTS, SPECIAL TOOLS, NEW INVENTIONS, ETC. You can also make forgings and case harden steel. Your shop is not complete without a FOUNDRYETTE. Three sizes are available capable of making bronze castings of 1½, 3 and 6 pounds weight, aluminum, copper, brass, etc., $22.50, $29.50, $42.00 f.o.b. Kansas City. Domestic gas supply and 110 volt AC or DC energy required for operation. Write for circular.

KANSAS CITY SPECIALTIES CO.
Box 6022, Dept. S-5 **Kansas City, Mo.**

HOLD-E-ZEE

AUTOMATIC GRIP
SCREW-DRIVERS

UNSURPASSED QUALITY
Plus the
EXCLUSIVE GRIPPER

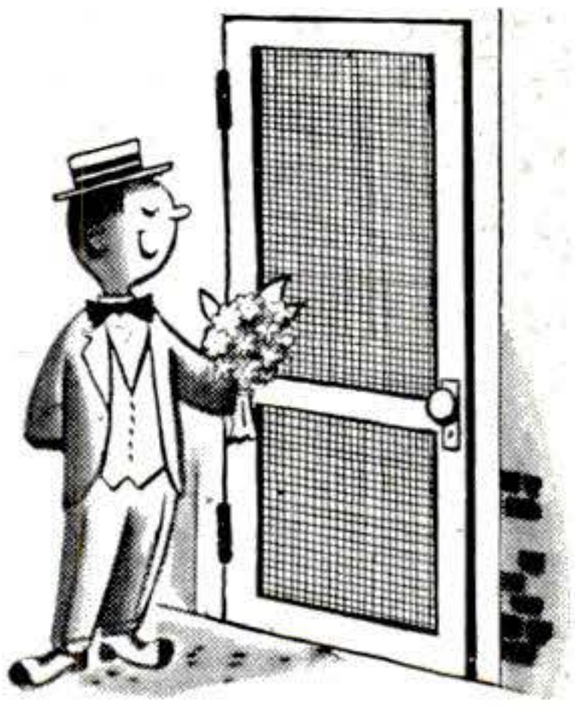
Gripper slides up out of way when not in use. Insulating handles. Complete range of sizes.
AT LEADING DEALERS EVERYWHERE

UPSON BROS., INC., 86 EXCHANGE ST., ROCHESTER 4, N. Y.

Copyrighted material

Now-A New Kind of Screening

STAINPROOF-RUSTPROOF -LASTS A LIFETIME

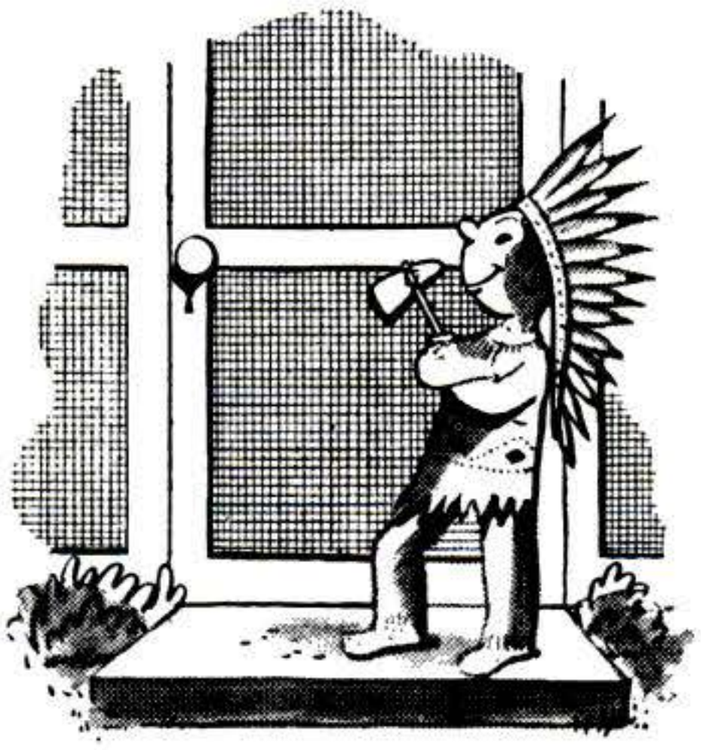


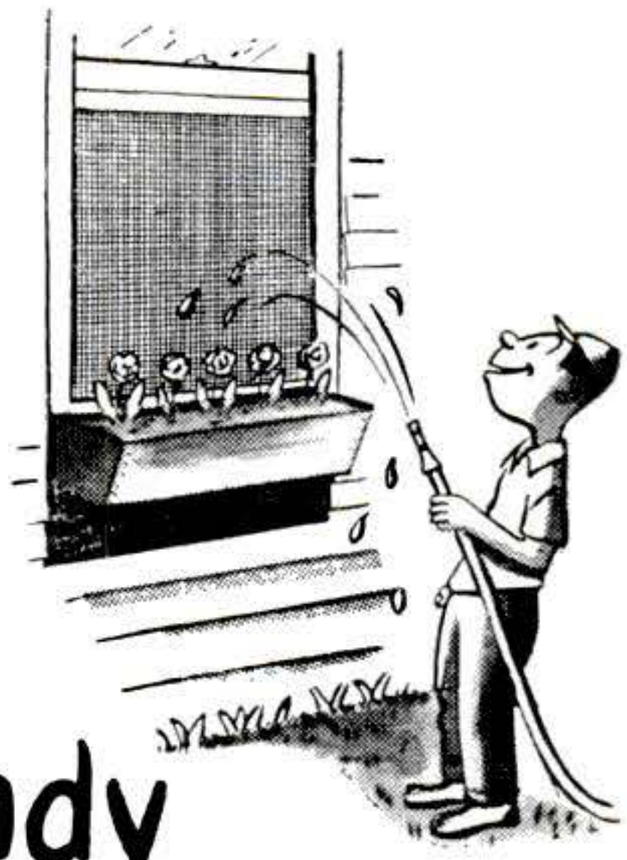
Handsome

Good looks are just a part of this amazing new screen material. Because it is absolutely rustproof . . . corrosion proof, LUMITE can *never* stain the sills or sidewalls of your house—*never* become ugly-looking or discolored.

Tough

Here's the screen you would never have believed possible . . that always stays taut and firm! Punch it, bump it, lean on it—it gives—then snaps right back when mounted properly. Lasts as long as your house





Handy

Perfect for the man-about-the-house, LUMITE is the no-upkeep screen. It never needs painting or any protective coating. It's amazingly easy to handle—you can cut it with ordinary scissors . . no special tools. No scratched fingers.

Different

Made from saran plastic, the fibres of this amazing material give LUMITE qualities never before imagined in an insect screen. Imagine—if you can—a screen completely unaffected by water sun, smoke, soot, acid fumes, or salt spray. That's LUMITE! *Sold by leading Hardware, Lumber or Building Supply dealers*

For information and free sample
write Dept. 53, Lumite Division
Chicopee Manufacturing Corporation
47 Worth Street, New York 13, N Y

* ®

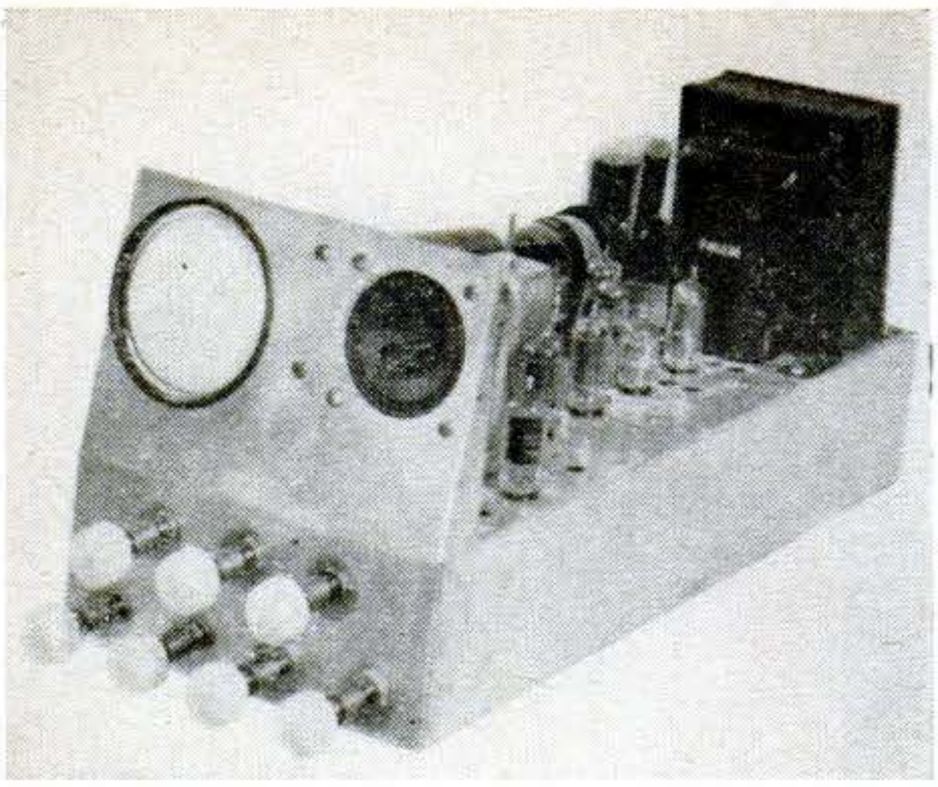
REPLACEMENT OR REFUND OF MONEY
Guaranteed by Good Housekeeping
IF NOT AS ADVERTISED THEREIN

Screen once and for all with

LUMITE*

Woven of saran

Copyrighted material



ESPEY TELEVISION KIT

Designed around modern circuits, and manufactured of the finest materials, this ESPEY Television Kit offers you the opportunity of building your own personal television set at unbelievably low cost. Kit is supplied complete (less tubes and cabinet) with all parts, punched and welded chassis, instruction book, etc. for only... **$69.50**

Magnifier makes 20 sq. in. picture!

*Prices 5% higher West of Rockies

For full details, write to Dept. PS-6

ESPEY MANUFACTURING COMPANY, INC.
528 East 72nd Street New York 21, N. Y.

INCREASED "GAS" MILEAGE! FREE TRIAL IN YOUR CAR!

Smoother Motor; Easier Starting; Faster Pickup; Slower Idling; with GANE AIR-FLOW NEEDLE for your Carburetor. $1.75 each installed by YOUR Service Station, Garage, Car Dealer on 10-Day Free Trial Money Back Guarantee, or Order Direct. Mail card for Free Data.

OCTA-GANE
2425 E. 57th St., Los Angeles 11

FLOYD CLYMER'S unbiased book

"INDEPENDENT TEST REPORT ON KAISER-FRAZER CARS"

Read what 3000 owners now think of their K-F cars. Expert, part-by-part analysis. 100 photos. Tells all. 3000-mile test run, Pike's Peak closed car record, gas mileage. Thousands are buying. Order now. $1.50 postpaid. $2.50 deluxe ed. Cash, money-order, or specify C. O. D. Moneyback guarantee. Clymer, Publisher, Dept. PS-6, 1268 S. Alvarado St., Los Angeles 6, Calif.

FASTEST PLANER in the WORLD at this Low Price... $195.00

BELSAW Multi-Duty Planer

Speed up production! Increase your profits! BELSAW power self-feeds at 24 feet per minute...The lowest-priced surfacer that will handle 12 x 6 in. stock. Planes green or dry sawed lumber into smooth, worked forms. Three high-speed steel knives make 42 cuts per inch. Multi-duty BELSAW takes inexpensive attachments for all planing mill operations — Jointing, Rabbeting, Grooving, Matching. BELSAW is the ***only*** 12 in. planer providing ***attachments for jointing and grinding its own knives.*** Start planning NOW for BIGGER VALUE and BETTER PERFORMANCE, with BELSAW. Write for FREE specifications, illustrations and low prices.

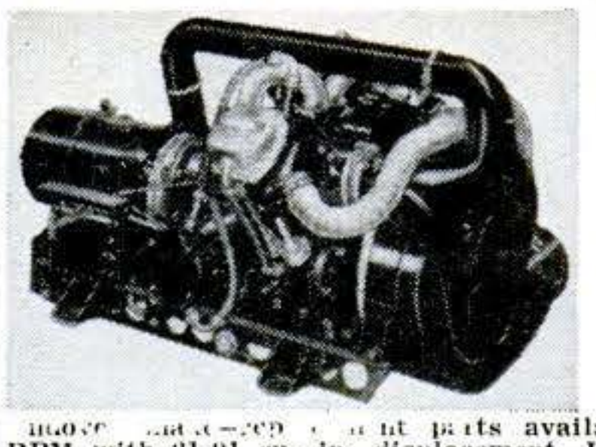
● LARGER CAPACITY ● FASTER OUTPUT ● KNIFE SHARPENING ATTACHMENT

BELSAW MACHINERY CO 8-1027 Field Bldg., 315 Westport Rd., Kansas City, Mo.

---

15 H.P. "V" TYPE ENGINES

TWIN CYLINDER:



Here is power galore for midget racing cars, speed boats, etc., or build your own garden tractor, mower, welding outfit, mill, saw, home lighting plant. Use it for any type of power job. Engines measure 32" long, 22" wide, 18" high. Mounts flat with mounting brackets 14" apart each way.

FOR SHOP, FARM AND HOME POWER

Precision built—orig. acquisition cost many times our asking price. Famous motor [illegible] parts available. Designed for 3600 max. RPM with 31.91 cu. in. displacement. Full 2¾" bore, 2 11/16" stroke. Dual carburetion with shielded ignition and fuel system. Removable governor included. Each motor is fitted with 28.5 volt generator (removable) ideal for welding outfits.

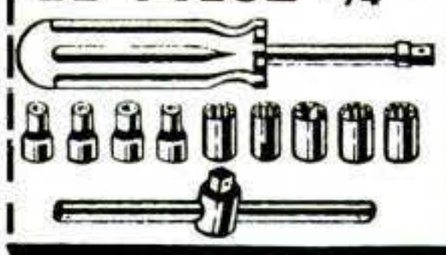
A RARE BARGAIN AT THIS LOW PRICE

These are built to run like a Rolls-Royce. Slightly used but guaranteed perfect—some like brand new. Guaranteed as described or your money **back. Your cost, each, only $119.00—two or more, $110.00 each** while they last. Send check or money order. You've seen our ads since 1941.

FEDERAL IDENTIFICATION CO.
1910 CLASSEN BLVD., Dept. B OKLAHOMA CITY, OKLA.

---

11 PIECE 1/4" SOCKET WRENCH SET



Ideal for repairing Carburetor, Refrigerator, Ignition Systems or Radio. Contains complete range of 9 sockets from 13/16 to 7/16, spintite handle and sliding tee handle, especially valuable for reaching countersunk nuts and bolts which ordinary wrenches cannot reach. **$2.00**

WE PAY POSTAGE—NO C.O.D.'s. SEND CASH, CHECK OR MONEY ORDER

INDUSTRIAL SUPPLY COMPANY | 312 EAST 33rd ST. NEW YORK 16, N. Y.

"PLASTICS"

Work in a fascinating and profitable hobby. Just out—our latest fabricating manual. Tells you how to work with Plastics. Our new Catalogue provides all needed materials: Plexiglas—Lucite—Tenite—Catalin—Acetate—all in sheets, rods, and tubes. Complete line of cements, dyes, accessories and supplies. Send 20c today for Fabricating Manual and Catalog.

HOUSE OF PLASTICS
8648 Linwood Avenue, M. O. Dept., Detroit 6, Michigan

WILPOP SPRINKLERS

AS MODERN AS TOMORROW

● Sprinkler heads that "pop up" when the pressure goes on give a better lawn appearance. Trouble-free machined brass construction. Self cleaning. Compact—just 1⅞" retracted. Operate on any pressure. All full, half and quarter heads adjustable. Use less heads with Wilpop Sprinklers. See your dealer TODAY.

Send for FREE FOLDER

WILJACK COMPANY 1128 Mission, South Pasadena, Calif.

Compact TRAVELING CLOCK

Accurate clock in attractive, traveling case. Opens as stand. Removable for home use. Luminous dial. Fits into vest pocket. Ideal for camping, hunting, etc. Guaranteed.

A RARE BUY

ONLY $8.50 all taxes included
No C.O.D.'s. We pay postage

ATLAS FIFTH AVE. Dept. P, 225 Fifth Ave. New York 10, N.Y.

Actual Photograph
Ht. 7 in. Wt. 36 oz.

7x50 PRISM BINOCULARS

Military Specifications
Brand New With Leather Case

COATED... $58

Uncoated..... $48

PLUS 20% TAX

Descriptive Literature on Request

BROWNSCOPE CO. DEPT. 6P, 24 WEST 45 ST. NEW YORK 19, N. Y.

Copyrighted material

Used on more new cars -sold by more dealers!

replace with a

DELCO

BATTERY

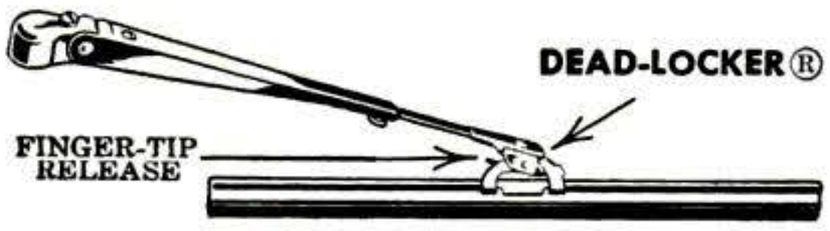
DELCO-REMY WHEREVER WHEELS TURN OR PROPELLERS SPIN

Copyrighted material

ANCO® RAIN-MASTER®

WINDSHIELD WIPER BLADES and ARMS

Blade snaps on—Stays put
Can't fall off—Can't blow off



Don't Blame Your Gas-Pump Man!

Sure, he knows how dangerous it is for you to drive your car . . . in stormy weather . . . with dull old windshield wipers that *smear* and *SMEAR!*

He'll gladly put on for you—quickly—a pair of keen new ANCO RAIN-MASTER Blades—or Blades and Arms.

HE NEGLECTS YOU?

He has RAIN-MASTERS . . . But he forgets to remind you? Too busy?

After all it's *YOUR* car to protect. ...So, *YOU* ask *HIM* for RAIN-MASTERS next time you buy gas....Patented features....Original equipment on DeLuxe Models of high-grade cars . . . because RAIN-MASTERS *Clean quicker—Clean cleaner—Last longer.*

Get yours—next time you buy gas. May save you a costly smashup!

Made by ANCO . . . makers of the new CLEAR-FLEX* Wiper Blade—the only Blade worth more than RAIN-MASTER. Costs more. Ask your good ANCO dealer to show you why.

*Trade Mark

Quality Protected Under Fair Trade Laws
ANCO Patented Products—Patents Make Jobs

THE ANDERSON COMPANY
Established 1918
GARY, INDIANA

No Rod Can Touch WONDEROD'S *ACTION* and *POWER!*

Shakespeare's RESINATED GLASS FIBER MAKES THE DIFFERENCE

Fish-tested by thousands of commercial and sport fishermen—the unanimous opinion is —FINEST ROD EVER MADE for ACTION and POWER. You'll cast more accurately, and WONDEROD will take all Mr. Fish dishes out. Won't rust, rot or set. Resinated glass fibers, produced by exclusive HOWALD Resinating Process, gives amazing resiliency, strength—is secret of WONDEROD'S ACTION and POWER. Buy at your sports store.

FREE TACKLE BOOK and Pocket Fishing Calendar. Tells how to bait and fly cast. Reels, Rods, Lines, Accessories. Write for yours—SHAKESPEARE COMPANY, Dept. 90, Kalamazoo 2, Michigan.

Shakespeare
FINE FISHING TACKLE
HONOR BUILT *for* FIFTY YEARS

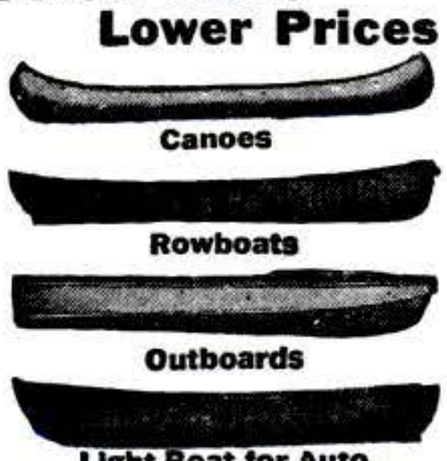
MUFFLERS
STEELS and ALUMINUMS with a motorboat tone

SINGLES, Chev., V-8, Plymouth, Steels $5.50, Aluminum $7.00. Chry., Olds., Buicks, etc., Steels $7.50, Aluminum $9.00. V-8 and MERCURY DUALS, Steel $17.50, Aluminum $21.00. Split Manifold Sets, Steels $35.00, Aluminum $45.00. Aluminums are guaranteed for life of your car.

SANDEE MUFFLER CO.
BOX 296 LA TIJ., LOS ANGELES 43, CALIF
2624 W. SLAUSON AVE., LOS ANGELES, CALIF.

Thompson **BEATS the World on BOATS**

Better Built Lower Prices



Safe Boats With Full Length Spray Rails
Keep passengers perfectly dry—even at high speeds. Catalog also shows two new models of "Take-Along" Boats. Two big factories—save you freight.

CATALOG FREE
Write for your copy. State kind of boat in which you are interested.

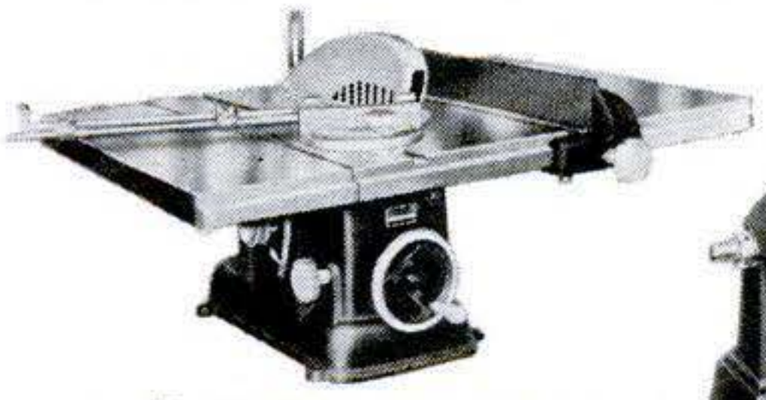
THOMPSON BROS. BOAT MFG. CO. (151)
219 Ann St. PESHTIGO, WIS. (*Write to either place*) 119 Elm St. CORTLAND, N.Y.

Copyrighted material

THE foster LINE

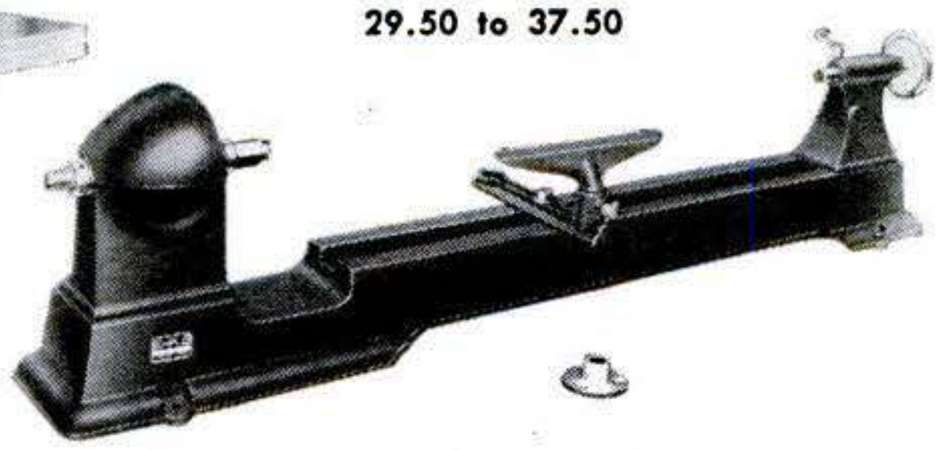
TRADE MARK

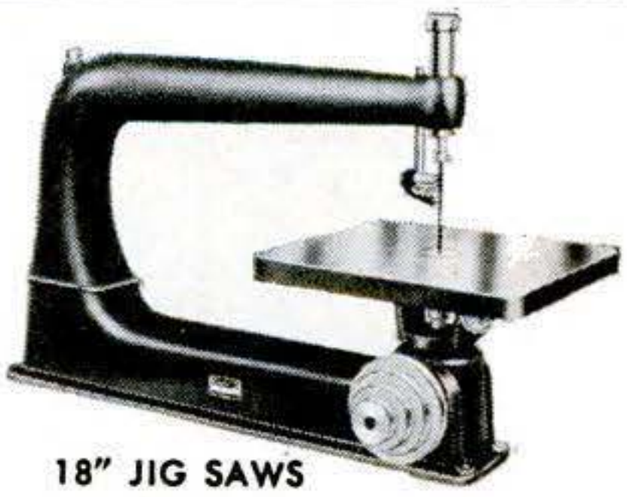
POWER TOOLS



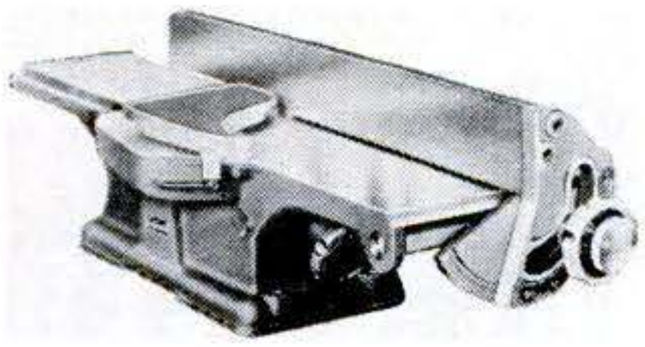
8" TILTING TABLE SAWS
44.95 to 75.00

9-12" LATHES
29.50 to 37.50





18" JIG SAWS
39.95



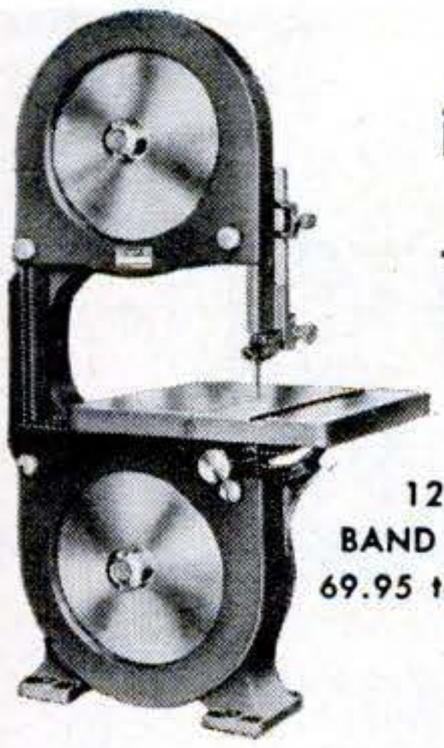
4" JOINTERS
39.95

DOLLAR FOR DOLLAR
TOOL FOR TOOL

THE foster LINE

LEADS THE FIELD

SPINDLE SHAPERS
29.95 to 99.50



12-14"
BAND SAWS
69.95 to 84.50

Make your selection from this broad line. You'll find just the right Foster Power Tools to fill your needs.

Built to serve home, farm and industry Foster Power Tools have all the latest design and construction features.

12"
DRILL PRESSES
49.50

33 fine tools
FROM WHICH TO CHOOSE

• 10x2¾" THICKNESS PLANERS	$119.50
• 12¾x4" THICKNESS PLANERS	230.00
• 12" TILTING ARBOR SAWS	147.50
• 8" RADIAL ARM SAWS	119.50
• DRUM AND DISC SANDERS	29.95
• 12" WOOD TURNING CHISELS-set of 6	6.95
• 17" WOOD TURNING CHISELS-set of 8	12.50

CIRCULAR SAW BLADES — DADO HEADS
SHAPER HEADS AND KNIVES

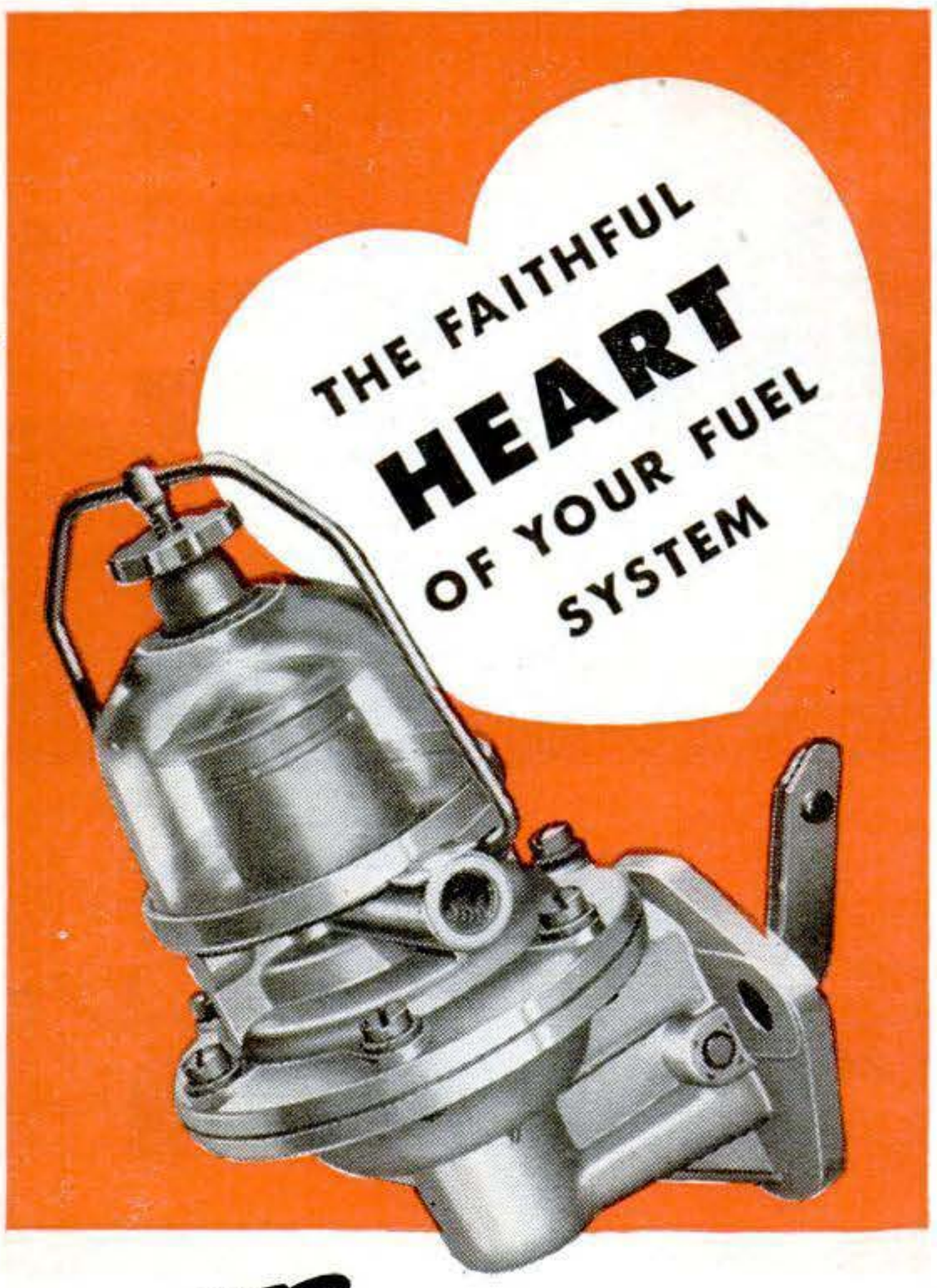
SEE THEM NOW AT
YOUR FRIENDLY FOSTER DEALER

FOR FREE CATALOG SHEETS
SEE YOUR DEALER OR WRITE DIRECT

foster manufacturing co.

3 KINSEY AVE, BUFFALO 17, N. Y.

Copyrighted material



OVER 30,000,000 IN USE TODAY

Pulsing steadily, nearly 100,000 times an hour, your AC Fuel Pump is the strong, reliable heart of your fuel system. It has given you long, faithful service because of its inbuilt quality and scientific design.

You can prolong that faithful service indefinitely, if you insist upon a new AC when you replace your present pump.

There is no satisfactory substitute for quality.

AC Fuel Pumps

AC SPARK PLUG DIVISION • GENERAL MOTORS CORPORATION

HANDY FLEXIBLE SHAFT

- ***Converts Any Motor, Drill Press, Electric Drill, Electric Fan Into A Handy Rotary Tool.***
- Attach ROTA-SHAFT in a Jiffy. Can Be Used for Grinding, Polishing, Sharpening, Cleaning, Engraving, Marking Tools, Carving, On Metal, Plastic, Wood, Glass.

YES! Only $2.95 and ROTA-SHAFT turns your old motor, drill press, electric drill or electric fan (10 inch or larger) with blades removed, into an efficient, versatile Flexible Shaft Tool for doing hundreds of grinding, polishing, sharpening jobs, especially in hard-to-get-at places. Attaches to motor shaft or in chuck. Convenient handpiece for ease of handling. Generous 40-inch overall length. Comes complete with buff and sanding disc ready to use in a drill press chuck. Order today.

SEND NO MONEY! Just mail order. Pay postman only $2.95 plus postage on delivery, or send $2.95 and we pay postage. Try 10 Days—if not delighted return for money-back.

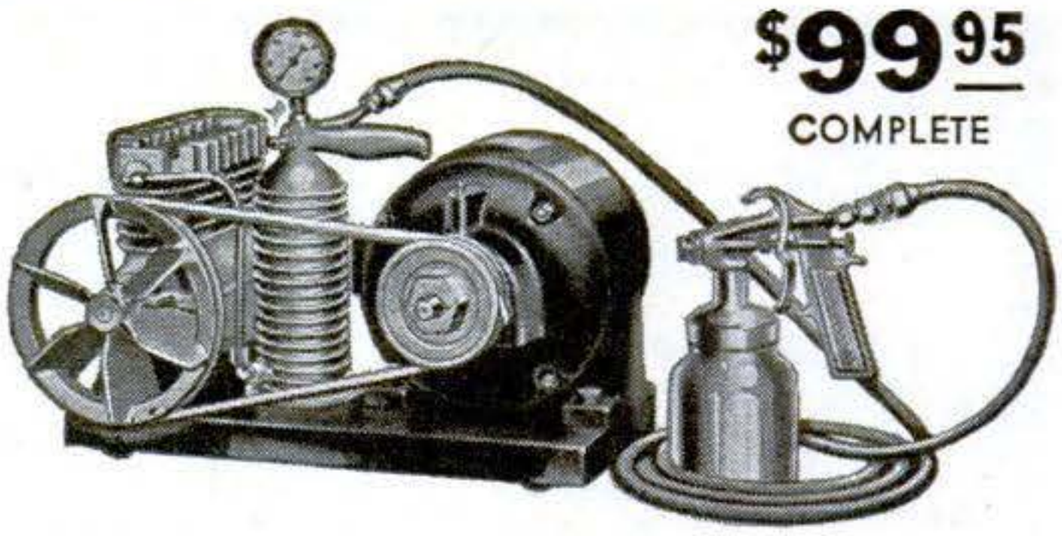
If you order Rota-Shaft for use on motor add 35c for Special Coupling and State Shaft Diameter. MAIL ORDER NOW!

STRADER PRODUCTS CO. Dept. D-102
259 Strader Ave. Cincinnati 26, Ohio

PRESSURE QUEEN

FOUR CYLINDER
PORTABLE AIR COMPRESSOR
SPRAY PAINTING OUTFIT

$99.95 COMPLETE



COMPACT • RUGGED • POWERFUL

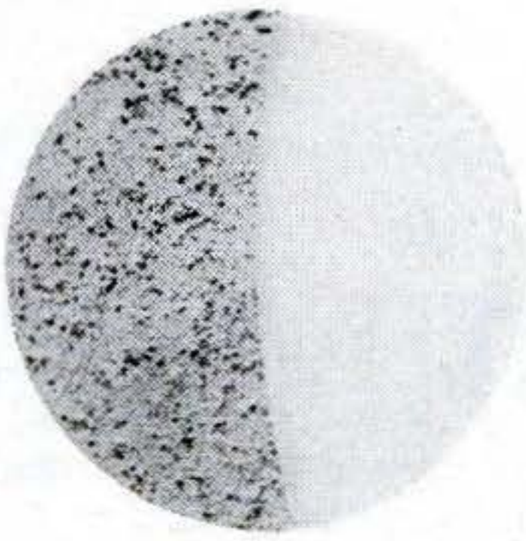
The ideal air supply for home and farm workshop, machine shop, garage, service station and contracting painter. Inflates tires; refinishes automobiles, trucks, implements and furniture. Paints buildings better, faster and at lower cost than brush work. Compressor has 4 cylinders, drop forged crankshaft, heat treated valves and pistons, bronze bearings, forced feed lubrication. 50-60 lbs. pressure without pulsation. Price includes compressor as shown, with air gauge, 15 ft. hose, spray gun and ⅓ h.p. motor; fully guaranteed. With ½ h.p. motor—$109.95.

IF YOUR DEALER DOES NOT SELL PRESSURE QUEEN WRITE DIRECT.

THE CAMPBELL-HAUSFELD CO.
151 RAILROAD AVE. HARRISON, OHIO

Copyrighted material

Exclusive Du Pont Formula Makes Polishing EASY!



A small section of the surface of an average car magnified 20 times. The left side is shown still covered with Traffic Film. The right side has been cleaned with Du Pont NO. 7 POLISH.

DU PONT Nº7 POLISH

Contains "stroke saving" methyl cellulose

Save work, save time, give your car a brilliant shine . . . with easy-working Du Pont NO. 7 POLISH! It is made by a patented formula . . . loosens dirt and grime quickly . . . cleans up *fast* without streaking . . . produces a high, dry gloss. Use NO. 7 POLISH to restore original color and lustre—the *easy way!*

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

Attention . . .
NEW CAR OWNERS!

Here's a wax-polish made especially for *new* cars—and others whose finish is in first class condition. It cleans and wax-polishes in one easy operation. Produces a brilliant, lasting lustre. Keeps cars looking new.

DU PONT SPEEDY WAX

Copyrighted material

Speed Sweep

THE BRUSH WITH THE STEEL BACK

MD

Sweeps cleaner, faster—lasts ordinary brushes 3 to 1!

Mail Coupon Today

Milwaukee Dustless Brush Co.
530 N. 22nd St., Milwaukee 3, Wis.

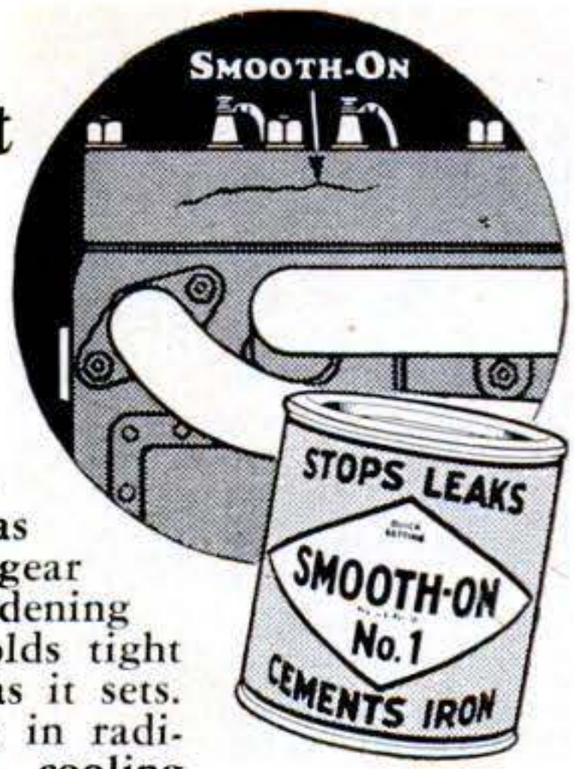
Please send me complete information about Speed Sweep brushes.

Name _____

Street Address _____

City, State _____

Cracked Water Jacket SEALED TIGHT



Use Smooth-On No. 1 Iron Cement to seal cracks in cast metal parts such as water jackets, crank cases, gear cases, etc. This quick-hardening cement stops leaks and holds tight—for it expands slightly as it sets. Use it, too, to stop leaks in radiators, gas tanks, heating, cooling and exhaust systems. Keep Smooth-On No. 1 handy for many auto and household repairs. Buy it in 1-, 5- or 20-lb. size at your hardware store. If they haven't it, write us.

FREE 40-Page Repair Handbook

Shows, besides above repairs, many time-saving, money-saving household uses. Heating and plumbing system leaks stopped. Loose hinges, handles, parts tightened. 170 illustrations. Write for your free copy TODAY.

SMOOTH-ON MFG. CO., Dept. 58F,
570 Communipaw Ave., Jersey City 4, N. J.

Do it with

SMOOTH-ON

THE IRON CEMENT OF 1000 USES

LAWN ORNAMENT-NOVELTY PATTERNS

28 Lawn Ornament Patterns, 25c, Other patterns: 15-20" high; Dutch Girl, Dutch Boy, Pirate, Bull Terrier, Mexican Girl, Mexican Boy, Dwarf, Penguin, Flower Girl, 10c each. 25 Novelty Patterns, 30c. **All 62 Full Size Patterns, $1.00 Postpaid.**
Strother Pattern Service, Dept. 7-AF, Box 383, Belington, W. Va.

BUILD YOUR OWN FAN

One-piece cast aluminum propellers for cooling and ventilating.

Size Inches	Polished 2 Blade	Polished 3 Blade	Unpolished 2 Blade	Unpolished 3 Blade	Bore Inches
15	$3.00	$4.00	$2.50	$3.00	½, ⅝, ¾
18	3.75	4.50	3.00	3.50	½, ⅝, ¾
20	4.00	5.00	3.25	4.00	½, ⅝, ¾
24	4.50	5.50	4.00	4.50	½, ⅝, ¾

Write for pamphlet on larger fan blades, wire guards, fan bases, shutters, pillow blocks, exhaust fan frames, etc., shipped prepaid if money accompanies order.
Dealers write for discount.

KLOPPENBORG ALUMINUM FDY., Dept. PS 68, Davenport, Iowa

Opportunity UNLIMITED

Today hundreds of average American men and women are building a profitable business of their own with Tradio-ette, the coin radio functionally-designed for booth operation in taverns, restaurants, ice cream parlors, etc. Making money with Tradio-ette is about the simplest and most lucrative business you ever imagined. You need no experience and your educational background is of minor importance. You merely install the sets on a percentage basis in locations all around you and make periodic collections. Only a small investment is needed to get in on the ground floor. Opportunities for expansion are unlimited.

Send for complete information. Write: Dept. O-6.

TRADIO, Inc. ASBURY PARK NEW JERSEY

Copyrighted material

Operates from Auto Truck or Tractor Motor

Speedy Jr.

"For only $4.85 I'm Painting the EASY Way!"

Now paint things *in minutes* instead of hours! Save money besides! Speedy Jr. needs no electric motor or compressor. Just fill cup—attach to spark plug opening—idle auto—and spray away! Gives that smooth factory-look to furniture, toys, handicraft, screens and auto touch-up. Inflates tires and sprays insecticides, too.

At hardware, auto supply, paint stores, complete with 18-ft. hose, only $4.85.

Write Dept. 20 for Free Booklet—*"How to Spray" and Catalog*

W. R. BROWN CORP. 5720 Armitage Ave., Chicago 39

Makers of famous "Speedy Sprayer"

8 ways to make a FRIENDLIER YARD ...JUST 10¢

STANLEY Reg. U.S. Pat. Off. **PLAN SET No. 14**

● Lure the birds you like by building them a home . . . 5 types plus a feeding box. Plans also for garden seat and a trellis. Hours of pleasure and a better yard. Send 10c for Plan Set No. 14 and list of others. Stanley Tools, 268 Elm St., New Britain, Conn.

The SPEED SAW FILER

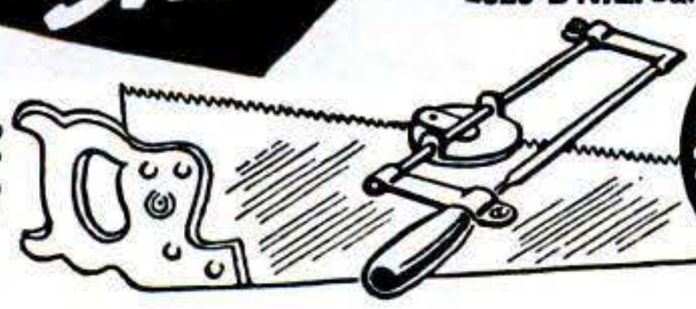
Saves You Time, Money

NOW FILE Your Own SAWS

Now you can do expert saw filing at home. Lifetime tool makes precision filing easy for even the most inexperienced. Two simple adjustments make it fit any type hand saw. Keep your saws extra sharp and true-cutting with a Speed Saw Filer. Complete with file, ready to use. Money back guarantee. Cash with order, prepaid (C.O.D. postage extra.)

THE SPEED CORP.
2025-B N.E. Sandy, Portland 12, Ore.

ORDER NOW!



$2.95

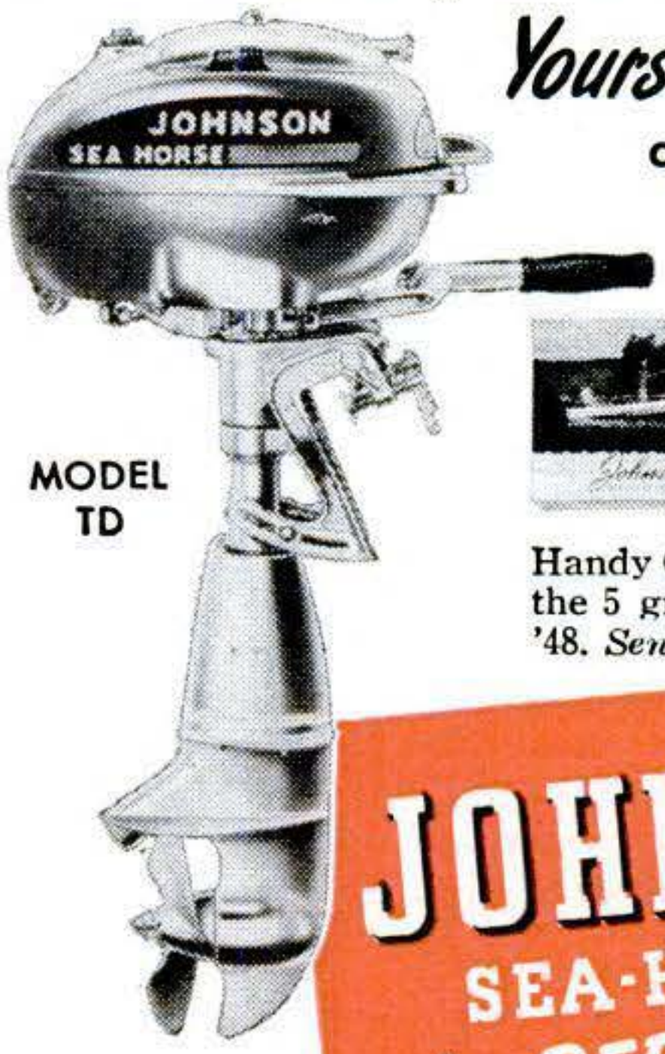
5 GREAT MODELS

Model HD	Small Alternate Firing Twin	2.5 H.P.
Model TD	Medium Alternate Firing Twin	5.0 H.P.
Model KD	Large Alternate Firing Twin	9.8 H.P.
Model SD	Super Alternate Firing Twin	16.0 H.P.
Model PO	Heavy Duty Opposed Twin	22.0 H.P.

All ratings are OBC Certified Brake H.P. at 4000 r.p.m.

OBC

The finest motors Johnson ever built—each one proved by years of use in the hands of thousands of owners. Packed with fine performance features, which *keep on* performing season after season. Ask your Johnson Dealer to show you. Look for his name under "Outboard Motors" in your classified phone book.



MODEL TD

Yours for Years OF SWEET PERFORMANCE

FREE Handy Chart

Write for the new 1948 Sea-Horse Handy Chart. Illustrates, charts the 5 great Johnson motors for '48. *Sent free.*

JOHNSON SEA-HORSES *for DEPENDability*

JOHNSON MOTORS 500 PERSHING RD., WAUKEGAN, ILLINOIS

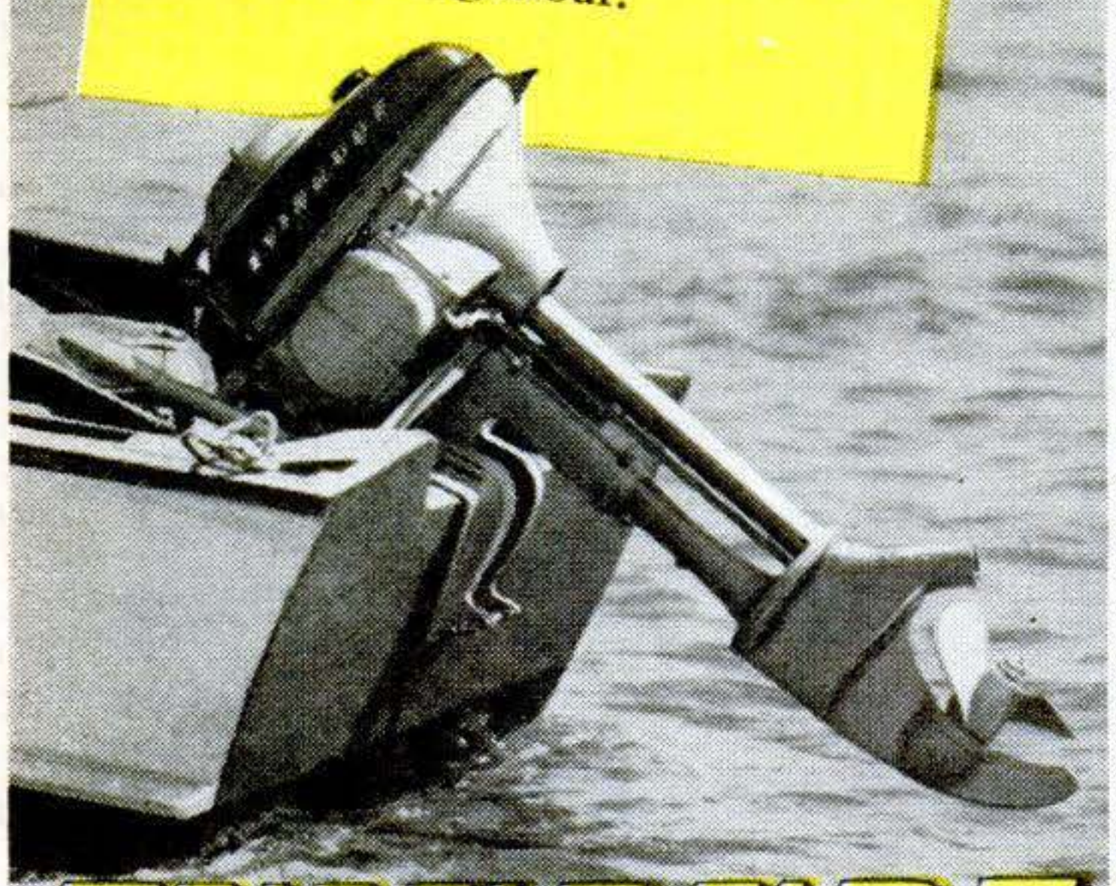
Johnson Motors of Canada, Peterboro, Canada

Copyrighted material

The Real Ticket for fishing fun!

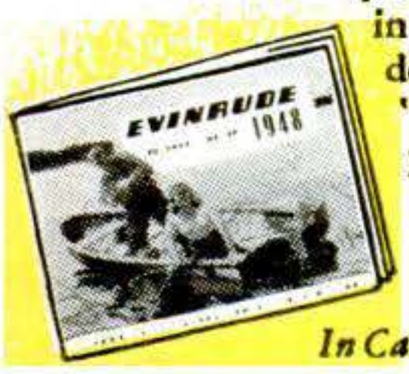
It's Head of the Class

— America's favorite "Four"... the silky, sparkling Zephyr! On fishing waters everywhere, it is known for superb performance, and for bonus features that add to fishing fun. Try the Zephyr on a boat . . . then decide if you'd settle for less than *four cylinder* smoothness — *four cylinder* starting ease . . . *four cylinder* flexibility and low trolling speed! See your Evinrude dealer . . . he will gladly arrange a demonstration of the Zephyr, or its swift and spirited companion model, the Lightfour.



EVINRUDE

★★ **Two new stars** in the light motor field . . . the new Sportwin and Sportsman. Both offer the revolutionary FISHERMAN DRIVE . . . *weedless, shoal-riding, snag-proof* . . . **the real ticket for fishing in shallow or weedy waters. See your dealer — look for his name under "Outboard Motors" in the yellow pages of your phone book. *Catalog free* — write for it today! EVINRUDE MOTORS, 5789 North 27th Street, Milwaukee 9, Wisconsin.**



In Canada: Evinrude Motors, Peterboro, Ont.

FIRST IN OUTBOARDS • 39th YEAR

GOOD WEAR FOR WORK GOOD LOOKS FOR PLAY

REEVES Army Twill is a double duty fabric that's right for work and play. It's highly resistant to wear and tear, and its wide variety of vat dyed colors are fast to sun, water and perspiration. Being Sanforized*, it can take repeated washings and still come up fresh and new. For better looks and longer wear—demand Reeves Army Twill.

**Residual shrinkage less than 1%*

REEVES BROTHERS, INC.
54 Worth Street, New York 13, N. Y.

SPINNING WEAVING DYEING FINISHING Reeves

NEW 1948
Plastics Supplies Catalog

Just off press. Full details on Plexiglas, Lucite, rods, sheets, tubes. Acetates, cements, dyes, buffs, molding sets, tools, carving kits, accessories. Everything in plastics. Gives prices, sizes, colors, etc. Price 10c, stamps or coin, with ad for catalog.

PLASTICS MFG. & SUPPLY CORP.
Dept. S-6 4707 Euclid Ave. Cleveland 3, Ohio

PAINTERS' STRIPING TOOL

A TOOL... NOT A BRUSH

NEW, IMPROVED

Modern—streamlined—fits the hand like a fountain pen! Easy to use as a pencil. Draws parallel lines—straight, curve or circular. Does expert job on autos, furniture, toys, bikes, model planes, signs, bulletins, linoleum. (Makes wall board look like tile.) Every painter and craftsman needs one! Type "M" MASTER Painters' Striping Tool complete with tip for 1/16" stripe, $1.00. Extra tips 1/64", 1/32", 3/64", 1/16", 5/64", 3/32", 1/8"—75c each. Tool with complete set of 7 tips $5.00. (C.O.D. orders 25c extra.) Paint dealers, write!

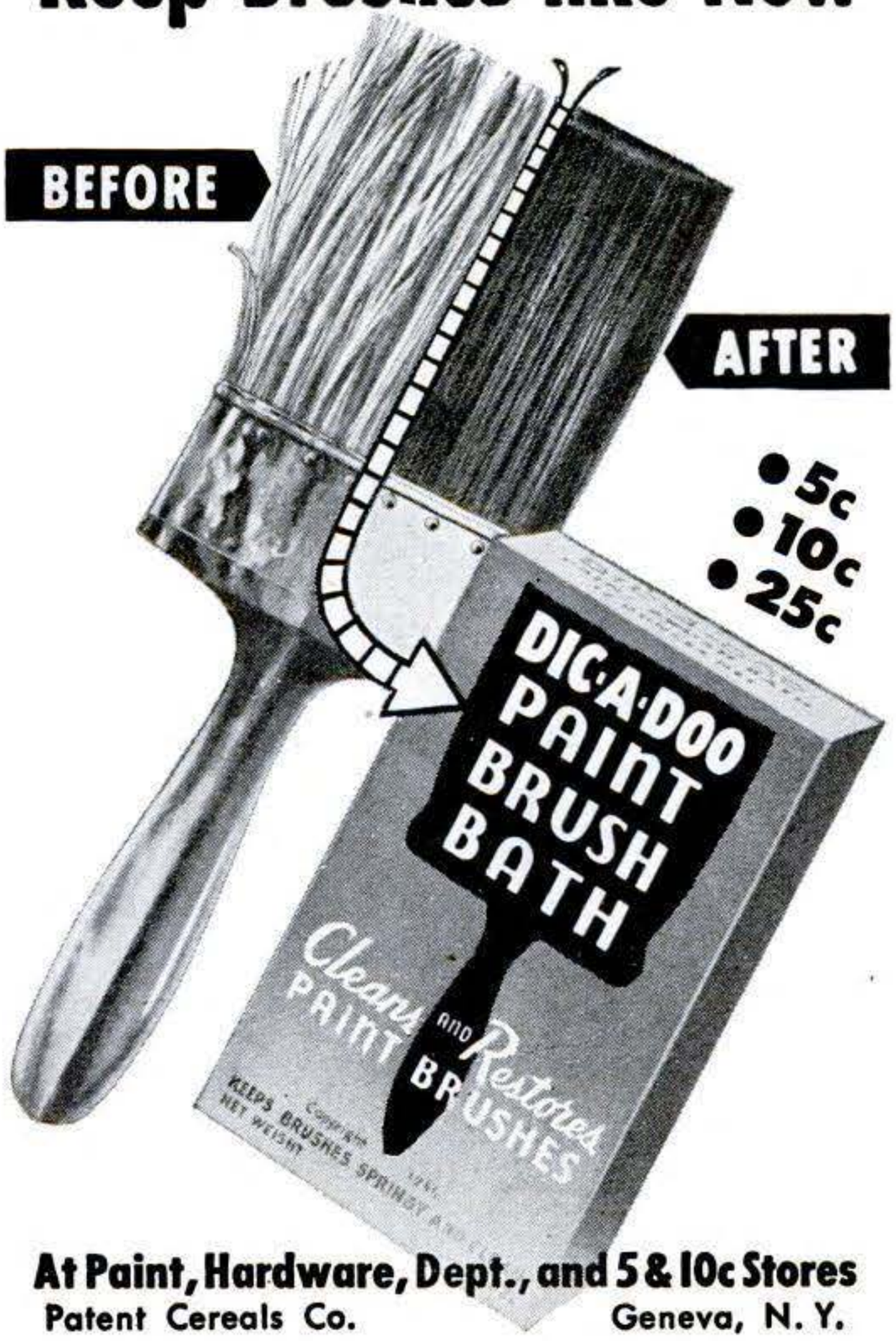
$1.00 POST PAID

EASY AS USING A PENCIL!

WENDELL MFG. CO.
4234-A Lincoln Ave., Chicago 18, Illinois

Copyrighted material

Keep Brushes like New



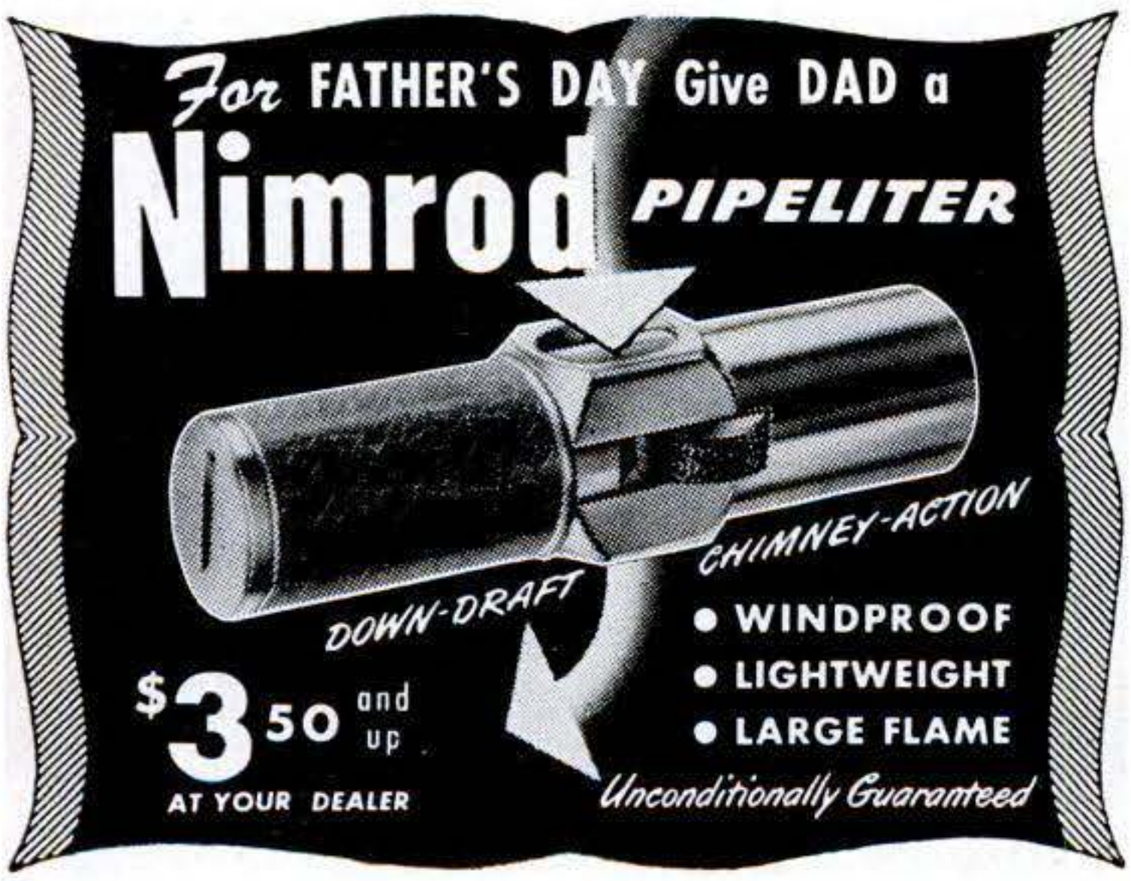
At Paint, Hardware, Dept., and 5 & 10c Stores
Patent Cereals Co. Geneva, N. Y.

DEEP TONE
Dual Mufflers
for Ford, Mercury

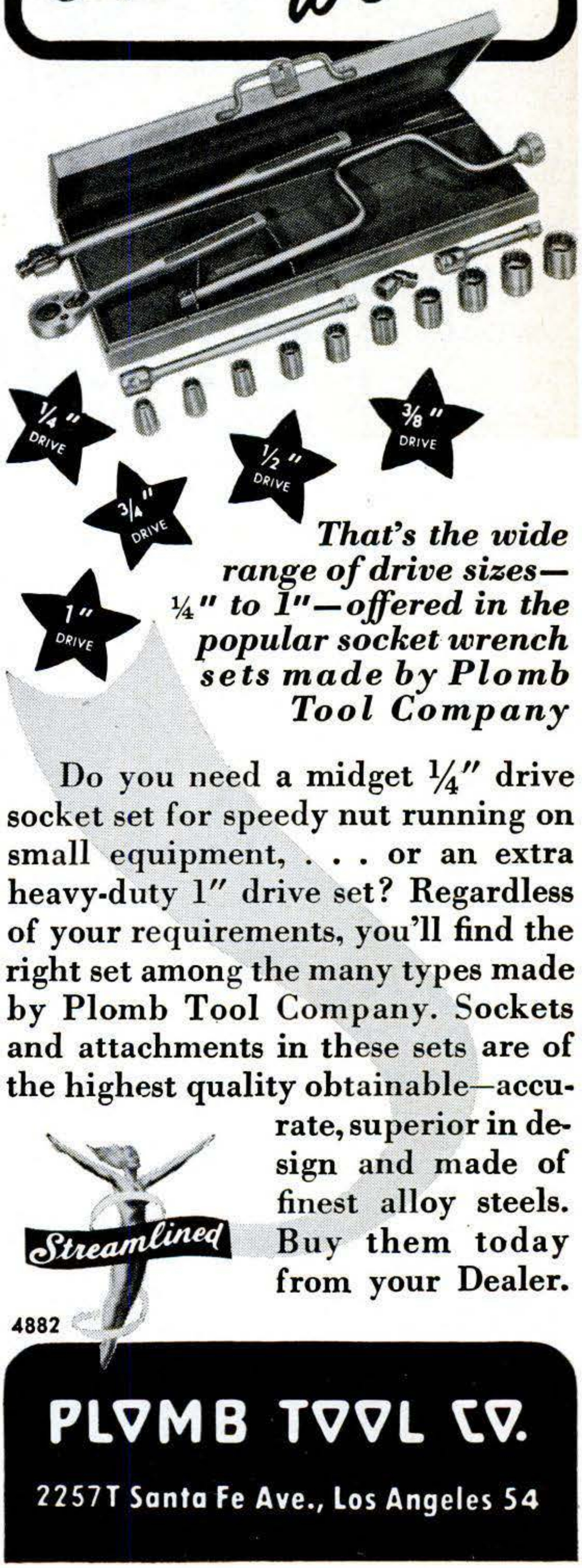
Scientifically designed straight-thru muffler reduces back pressure. Greater power, speed, and economy. NEW brilliant Deep Tone makes your car standout. Heavy blowout-proof construction. Rugged steel tube throughout (No aluminum).

Simplified Installation. No cutting, no holes to drill. Rubber mounted clamps eliminate usual rattle. Complete with all necessary fittings, etc. Order direct and save. State year and model. Sent C.O.D from Los Angeles. Price $20.
"Deep Tone" single muffler for Chevrolet, Ford, Plymouth—$4.86.
All other makes—$5.50. Chrome tail pipes, 2½" dia. $1.75

ADVANCE MUFFLER CO.
6800 S. Vermont, Dept. PS-68, Los Angeles 44, Calif.



Quarter to One!

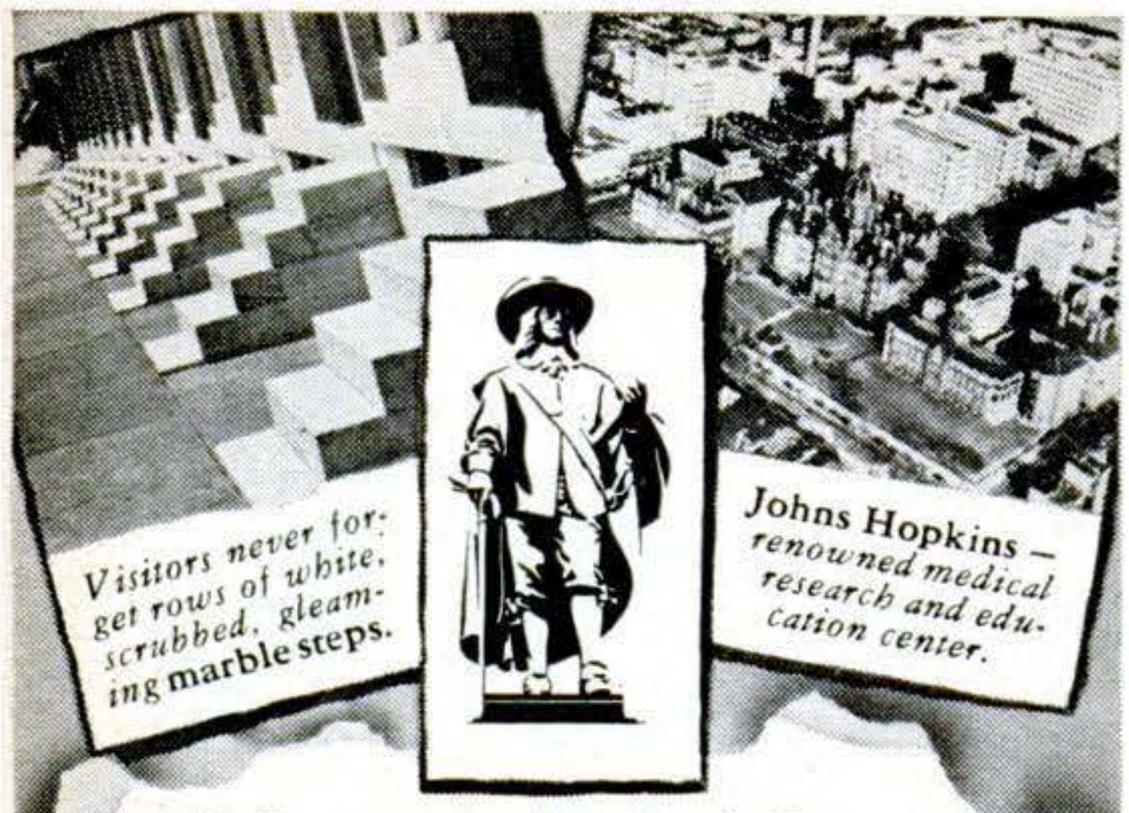


That's the wide range of drive sizes—¼" to 1"—offered in the popular socket wrench sets made by Plomb Tool Company

Do you need a midget ¼" drive socket set for speedy nut running on small equipment, . . . or an extra heavy-duty 1" drive set? Regardless of your requirements, you'll find the right set among the many types made by Plomb Tool Company. Sockets and attachments in these sets are of the highest quality obtainable—accurate, superior in design and made of finest alloy steels. Buy them today from your Dealer.

PLOMB TOOL CO.
2257T Santa Fe Ave., Los Angeles 54

Copyrighted material



The Lords Baltimore would be proud today...

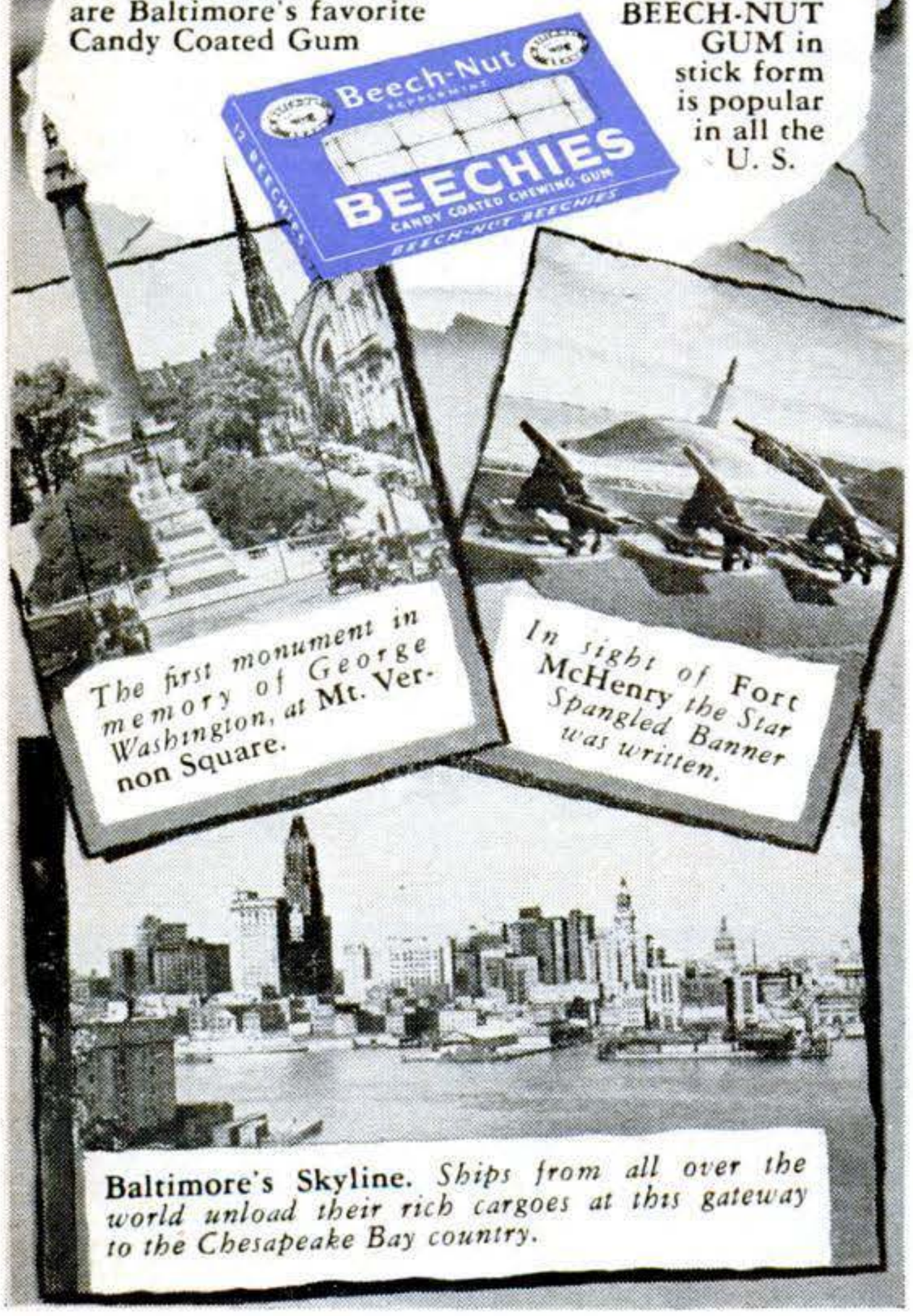
For the city, named in their honor, is one of America's busiest and most important seaports.

Going through by train or automobile, one sees little of the charm of this fascinating city — but Baltimoreans experience it every day. They know the fine art of gracious living. Rarely, in other cities, will you find one who "used to live in Baltimore," because it is too good a place to leave.

Beech-Nut Beechies

are Baltimore's favorite Candy Coated Gum

BEECH-NUT GUM in stick form is popular in all the U. S.



KESTER SOLDER MAKES METAL REPAIRS EASY

Use Kester Cored Solder for metal repairs as well as all metal craft hobbies. An outstanding product that will give you real soldering efficiency.

KESTER SOLDER COMPANY

4254 Wrightwood Avenue Chicago 39, Illinois

Factories also at Newark, New Jersey — Brantford, Canada

Cushman MOTOR SCOOTER

75 MILES PER GALLON

Try the new ride! Enjoy 75-mile per gallon economy... 35 mile an hour speed... easy parking. The Cushman Motor Scooter is a handy "second car" the whole family can use. You need it in your business, too. Sturdily built; powered by the famous Cushman 4 H.P. "Husky" engine. Dealers Everywhere.

Side-Kar attachment quickly makes an all-purpose vehicle of any 2-wheel model.

200 Lb. Payload or an extra passenger is easily carried. Attach or detach Side-Kar in a few minutes.

5 Cu. Feet of storage space. Solves delivery problem for drug, grocery, service station, farm, factories, small businesses.

FREE. Descriptive folders, name of your nearest Cushman Dealer and coupon good for **Free Demonstration Ride** — write today.

CUSHMAN ENGINES

For 47 years Cushman has produced high quality small air-cooled and water-cooled engines. These engines are available to original equipment manufacturers and other users.

Write for details.

CUSHMAN MOTOR WORKS, INC., Dept. S-600, Lincoln, Nebr.

Copyrighted material

Do both jobs { *cleaning* / *polishing* } at once !

Car care made easy with sensational

Liquid Polish

CARNU cleans
as you rub it on

So easy! Apply Carnu with any soft cloth. Rub just hard enough to loosen grime. The liquid dries quickly to a white powder.

CARNU polishes
as you wipe it off

Nothing to it! Powder-dry Carnu wipes off without hard rubbing—and takes all dirt with it. Finish sparkles with a showroom shine. Carnu makes chrome fittings glisten, too!

See what happens:

Before Carnu the finish is dull and rough with dirt and oxidized paint.

After Carnu the finish is bright as a mirror—so smooth that future dust and dirt flick off easily.

Get Johnson's Carnu at service stations, auto supply, hardware, department, grocery or variety stores.

How to weatherproof a Carnu Polish

A tough, protective coat of Johnson's Auto Wax does all three:

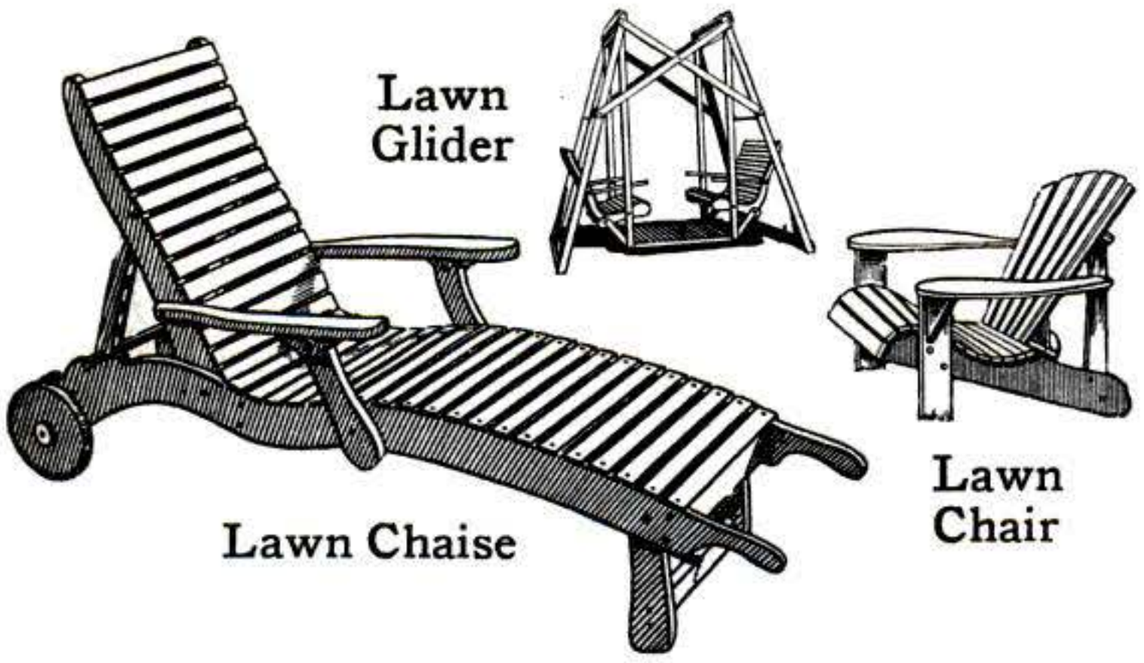
1. Maintains the Carnu shine
2. Protects the finish in all weather
3. Helps preserve the color.

Johnson's Auto Wax is easy-buffing wax—just the thing for any home handy-man who wants to give his car a professional shine. And there's no better protective coating. Johnson's Auto Wax guards the finish against sun, heat and moisture. You'll find it easier, too, to keep your car clean and shining—dirt can't imbed itself in the smooth, hard waxed surface. Johnson's Auto Wax is sold wherever Carnu is sold. Try it!

"Carnu" and "Johnson's" are registered trademarks

© S. C. Johnson & Son, Inc., Racine, Wis., 1948

Copyrighted material



SAVE MONEY, HAVE FUN, BUILD LAWN FURNITURE..

with EASI-BILD* Full-Size Patterns

You can build this lawn furniture at less than ½ the store cost—without special tools or skill! Easi-Bild Full-Size Patterns are easy to use. It's the dress pattern idea applied to flat lumber. Just trace, saw, and assemble. And for stronger joints throughout, use CASCOPHEN, Casco's new, waterproof glue.

*Reg. U. S. Pat. Off. by Easi-Bild Pattern Co.

How to choose a glue!

Follow these directions and you'll solve all your gluing problems:

For boats, outdoor furniture, sports equipment —joints that must withstand outdoor exposure—Cascophen (Resorcin Resin Glue). The first completely durable glue available to home-craftsmen!

For furniture, toys, heavy-duty home repairs —strong, stainfree, moldproof, highly water-resistant Cascamite (Urea Resin Glue). Mixes quickly with cold water!

For Models, photo prints, labeling —general home, school, or office gluing, use the new, clean, white, fast-setting Cascorez (Polyvinyl Resin Glue). Liquid, ready to use!

Send Coupon for Furniture Patterns to

Casco Pattern Dept. PS-68,
P. O. Box 215, Pleasantville, N. Y.

Enclosed is _____¢ for patterns checked below.

( ) Lawn Chair, Pattern #32—25¢
( ) Lawn Glider, Pattern #155—50¢
( ) Lawn Chaise, Pattern #78—35¢
( ) Please send free folder illustrating 100 patterns and free gluing chart.

Name _____

Address _____

City _____ Zone _____ State _____

THE BORDEN CO. • CHEMICAL DIVISION

Makers of Casco Glues

CAMILLUS

"FISHERMAN'S LUCK!"

A new, streamlined knife — true CAMILLUS quality and craftsmanship.

Long, slim blade of custom made steel, *chrome plated*, with scaler, hook disgorger . . . and, just in case, a cap lifter. Adds to your fishing pleasure. Speeds the job of dressing the catch.

Ask for "CAMILLUS Fisherman's Luck" at hardware or sporting goods stores.

No. 5
½ actual size
$2.00

For Dad on Father's Day June 20th

CAMILLUS *has the edge!*

Kă-MILL-us

CAMILLUS CUTLERY COMPANY, New York 17, N. Y.
Established 1876 . . . Factory at Camillus, N. Y.

No other tool like it!

BURGESS vibro-tool

Trade Mark Reg. U. S. Pat. Off.

Writes on . . .
Watches
Glassware
Tools
Leather
Plastics
Costume Jewelry
Pots and Pans
Sporting Equipment

$7.50

Engrave your name . . . etch letters or designs . . . place permanent identification marks on anything with this unique hand tool. Carves wood and linoleum, cuts cardboard and balsa, tools leather. Just plug in on any 110 volt AC line. No home shop is complete without a Burgess Vibro-Tool. See your dealer or write for information.

DELUXE KIT

Vibro-Tool complete with 22 attachments in handsome, polished wood chest.....$16.50

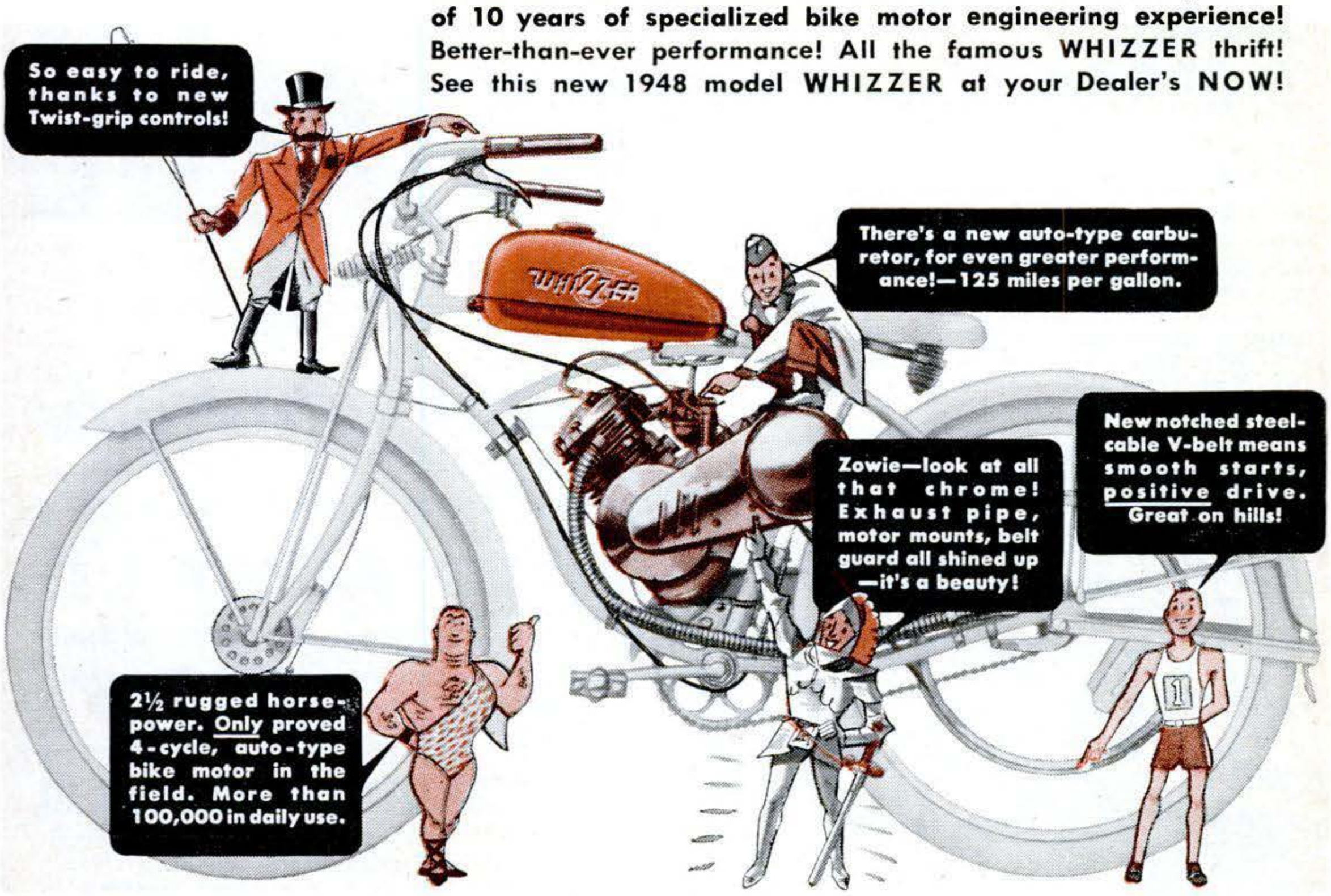
BURGESS Vibro-Tool Division

LAKE ZURICH, ILLINOIS

Copyrighted material

It's Here! The New '48 Whizzer Bike Motor

Latest in the great series of WHIZZER Bike Motors, it's the finest WHIZZER ever built! Packed with all-star features! The product of 10 years of specialized bike motor engineering experience! Better-than-ever performance! All the famous WHIZZER thrift! See this new 1948 model WHIZZER at your Dealer's NOW!



It's Wise To Go WHIZZER

America's Thriftiest Power Transportation

Fits all popular makes of men's balloon tire bikes. Over 3,500 Whizzer Dealers, at your service

Still Only $97.55 Plus tax, F. O. B. Pontiac, Mich.

Your Whizzer Dealer is as near as your telephone . . . or write Whizzer Motor Co., Pontiac, Mich.—For 10 years the world's largest bike motor builder!

Copyrighted material

THE NEW

MONARK

Super Deluxe

Dream bike of the century! Super streamlined "air flow" design with new "Air-Wing" head shield and dozens of other exciting new features. New mar proof and chip resistant finish. For sale by better dealers everywhere.

MONARK SILVER KING, INC.
6501 West Grand Avenue, Chicago 35, Illinois
Send Free Folder B-64 showing complete new Monark line in full color.

NAME_____

ADDRESS_____

CITY_____ STATE_____

Now for EVERY WORK SHOP!

NEW *Invention*

Electroplates *by* BRUSH

Easy to Plate CHROMIUM

GOLD, SILVER, NICKEL, COPPER

. . . For Pleasure and Profit!

If you have a workshop—at home or in business—you need this new Warner Electroplater. At the stroke of an electrified brush, you can electroplate models and projects—you can replate worn articles, faucets, tools, fixtures, silverware, etc. with a durable, sparkling coat of metal . . . Gold, Silver, Chromium, Nickel, Copper or Cadmium. Method is easy, simple, quick. Everything furnished—equipment complete, ready for use. *By doing a bit of work for others, your machine can pay for itself within a week.* So make your shop complete by getting a Warner Electroplater right away. Send today for FREE SAMPLE and illustrated literature. ACT AT ONCE! *Mail Coupon.*

WARNER ELECTRIC CO., DEPT. S-17
1512 Jarvis Avenue, Chicago 26, Ill.

FREE *Details & Sample!*

WARNER ELECTRIC CO., 1512 Jarvis Avenue, Chicago 26, Dept. S-17
Gentlemen: Send Free Sample and Details to:

*Name*_____

*Address*_____

City *State*

FREE

value packed

RADIO CATALOG

write for it today!

Lafayette Radio

DEPT. KF-8, 100 SIXTH AVE. • NEW YORK 13

BUILD YOUR POWER TOOLS

WITH OUR GUARANTEED INDUSTRIAL

POLY BALL BEARING **ARBORS**

(No extra charge for left hand threads) **ORDER NOW!**

C4-1/2x12 1/2 spindle, housing 2x8 $7.95 pp.
C5-5/8x12 1/2 spindle, housing 2x8 $8.25 pp.
C6-3/4x12 1/2 spindle, housing 2 1/4x8 $9.25 pp.
D8-1x17 1/2 spindle, housing 2 5/8x11 $17.00 pp.

New Departure Self Lubricating Bearings

Complete Line of Shaper Arbors Also Available.

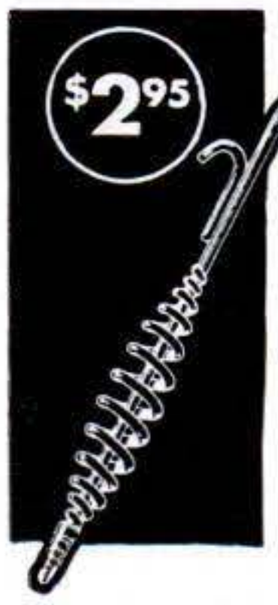
POLY PRODUCTS, 2032-B E. Walnut, Pasadena 8, Calif.

Get that NEW-CAR FEEL again!

SEALED POWER PISTON RINGS

The only ring with the Full-Flow Spring!

SEALED POWER CORP., DEPT. H2, MUSKEGON, MICH.



TORNADO

GAS TORCH

The Modern Way of Soldering

Ideal for hard and soft soldering. Will heat quickly; solder will flow freely and smoothly. No compressed air required. Self-adjusting. Safe. Economical. Can be used for annealing small parts and bending metal parts. Generates a heat of 1700° F. Simply connect to any illuminating gas jet with a rubber hose and operate. Tornado Torch No. 119 comes with three tips, (1/8", 1/4", 3/8" blast).

Tornado Gas Torch No. 119—Complete with 2 tips, for Natural Gas or Bottled Gas; with 3 tips for Manufactured Gas. $2.95 per set. See your dealer or order direct. Send check or money order—post paid.

Robco Corporation, 204 E. 44th Street, New York 17, N. Y.

Copyrighted material

NOW! BUILD 15 RADIOS $14.75

COMPLETE KIT ONLY...

Absolutely no Knowledge of Radio Necessary
You Need NO Additional Parts

THE PROGRESSIVE RADIO KIT is THE ONLY COMPLETE KIT. Contains everything you need. Instruction Book, Metal Chassis, Tubes, Condensers, Resistors and all Radio parts.

The 36-Page Book written by Expert Radio Instructors teaches you to build radios in a Professional Manner. You start with a 1-tube receiver. Before you are done with this kit, you will have built 11 Receivers, 1 Public Address System and 3 Transmitters.

SPECIAL FREE OFFER!

Electrical and Radio Tester sent absolutely FREE with each Progressive Radio Kit. PLUS FREE membership in Progressive Radio Club. Entitles you to free expert advice and consultation service with licensed radio technicians.

Write for further information, or ORDER your KIT NOW! ONLY..... **$14.75**

BUILD A 5 TUBE AMPLIFIER—*only* $5.95

Ideal for phonograph, FM tuner or microphone. Has 5 tubes including rectifier. Kit is complete with tubes, chassis, volume control, tone control, radio parts, hook-up wire, solder and instructions. We can provide a 4-inch PM speaker with mounted output transformer to fit on chassis, priced at $1.95. Or use this kit with your own speaker. It has 5 watts output, more than enough to drive a 12-inch speaker.

Postage prepaid with check or money order.
(Postage not prepaid with C.O.D. orders)

PROGRESSIVE ELECTRONICS CO., Dept. 97
497 Union Avenue **Brooklyn 11, N. Y.**

WHEELS
AT BARGAIN PRICES

...4" wheel & tire, 5/16" sleeve bearing.....$0.45 ea.
...5" wheel 5/8" solid tire 5/16" shaft hole.... 0.65 ea.
...6" wheel 5/8" solid tire 5/16" shaft hole.... 0.75 ea.
...7" wheel 3/4" solid tire 3/8" shaft hole..... 0.85 ea.
...8" wheel 1" solid tire 1/2" sleeve bearing.. 1.25 ea.
...8 x 2" wheel, semi-pneumatic tire 7/16" ball bearing..... 2.50 ea.
...10 x 1.75 wheel semi-pneumatic tire 7/16" ball bearing..... 3.25 ea.
...12 x 1.75 wheel semi-pneumatic tire 7/16" ball bearing..... 3.50 ea.
...10 x 2.50 wheel semi-pneumatic 1/2" ball bearing.....4.50 ea.
...6x2" wheel 5/8" ball bearing, solid tires... 2.95 ea.

BUILD YOUR OWN Wagons, Scooters, Soap Box Racers, Welding Carts, Baby Pens, etc.

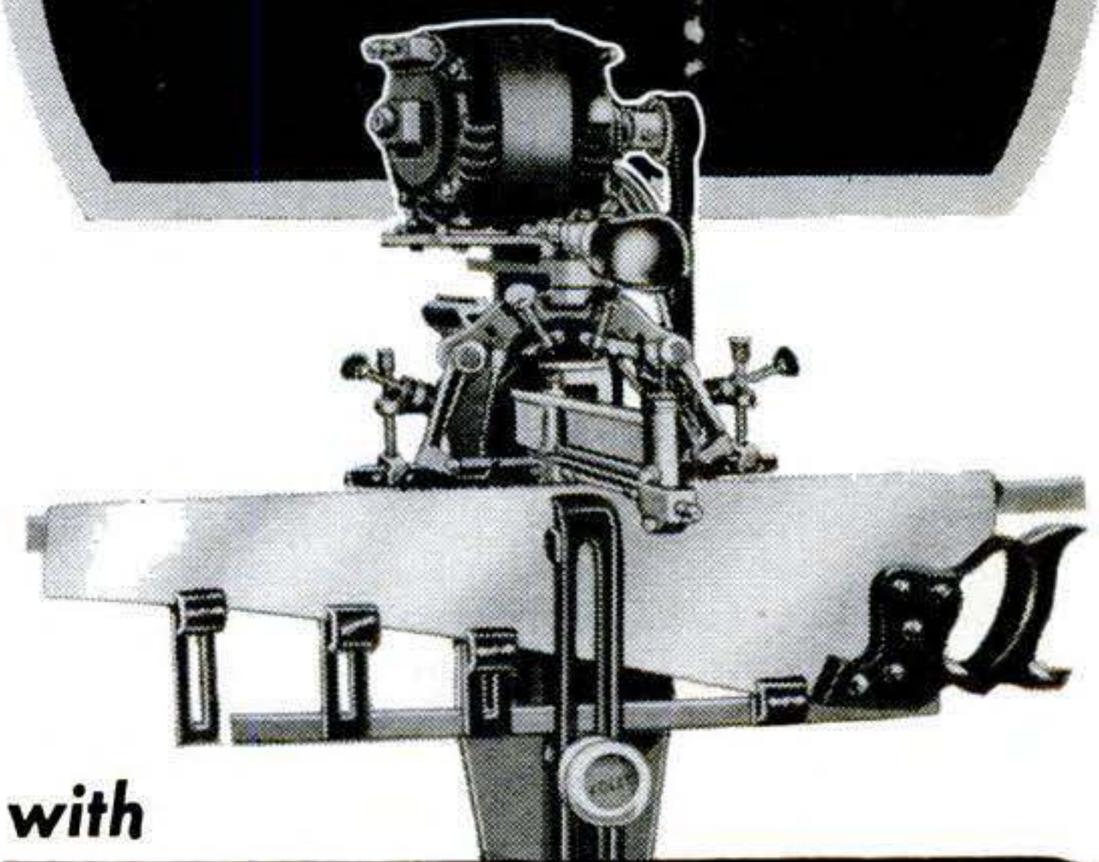
To order above wheels write number wheels wanted in space provided, tear out and mail this ad with check or money order and your name and address. If other sizes are wanted write for FREE LIST.
TRULSON MFG. CO., 811 E. 31 St., Dept. M116, Kansas City, Mo.

SAVE MONEY
build your own
SMITH COMPRESSOR

Now, use the world-famous Smith Air Compressor to operate rock drills, paving breakers, spray guns, sandblasting, etc., at low cost! Just order the Smith Compressor Head and Accessories with complete instructions for assembling. All you need is a Ford Motor and shop facilities. Capacity 60 cu. ft.—ample power for most compressor jobs. Pressure up to 100 lbs. per square inch. Head equipped with high speed compressor valves; automatic unloading and idling.

WRITE TODAY! **GORDON SMITH & CO., Inc.**
405 College Street Bowling Green, Ky.

Made $900 IN SPARE TIME



with

FOLEY* automatic SAW FILER

**Trade Mark Reg. U. S. Pat. Off.*

"I did very well last year with my Foley equipment, about 950 saws and 240 lawn mowers, in my spare time. About $900 for me." L.H.M., New York. A.G.W. in Mass. says: "I have filed over 5000 saws in 8 years and find the Foley Automatic Saw Filer very satisfactory."

Make up to $2 or $3 an hour in Spare Time. With the high prices of food, clothing and everything else, just think what you could do with extra money every week! With a Foley Automatic Saw Filer you can file hand, band and circular saws better than the most expert hand filer. "The first saw I sharpened with my Foley Filer came out 100%"—writes C.E.P. Every saw you sharpen with the machine accuracy of the Foley Saw Filer is an ad that brings you more customers. Cash business, no canvassing. No eyestrain, no experience needed.

FREE BOOK
INDEPENDENCE AFTER 40!

Shows just how you can start at home in spare time in your basement or garage. Just think—with a small investment, no overhead, no stock of goods to carry, you can get right into a cash business—and later on develop into a full-time repair shop. Send coupon today for this practical plan.

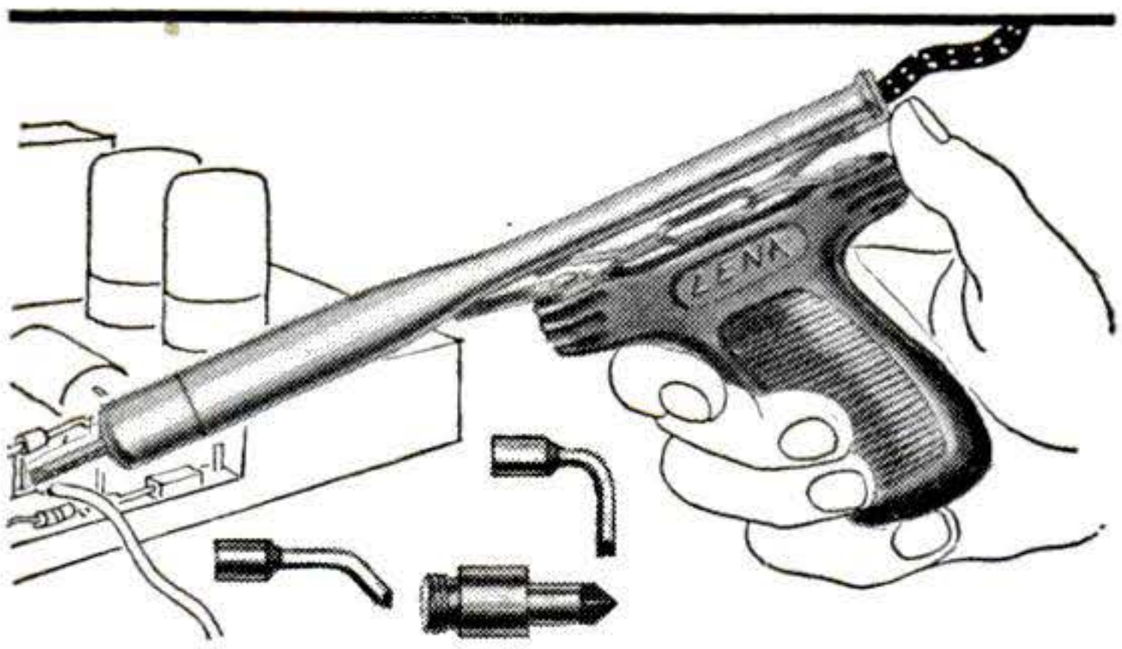
Send Coupon for FREE BOOK

FOLEY MFG. CO., 619-8 Foley Bldg., Minneapolis 18, Minn.
Send FREE BOOK—"Independence After 40".

Name.....

Address.....

Copyrighted material



All Soldering is a Cinch with the

LENK Gun-Grip*

SOLDERING IRON

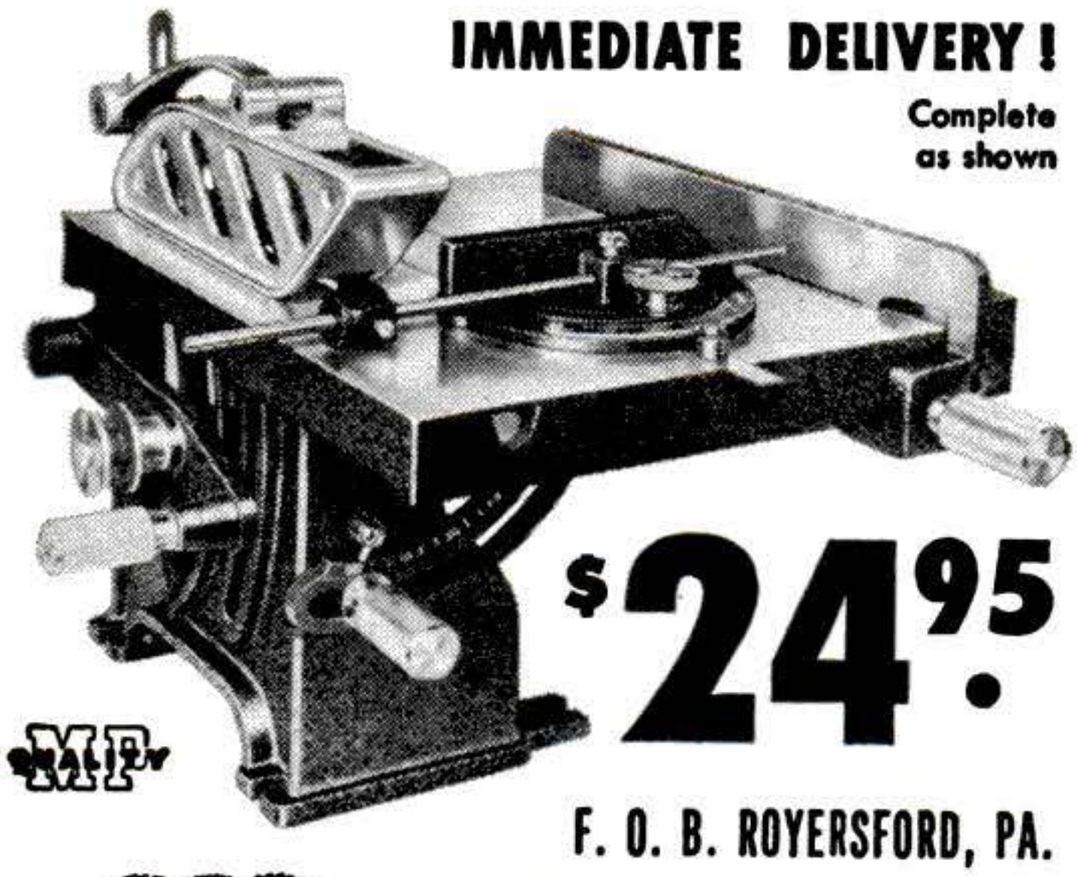
The perfect Soldering Iron for hobbyist, novice and mechanic. **Has always cool, unbreakable plastic Gun-Grip. 4 interchangeable tips for varied angle approach—light and heavy duty. Spring construction cushions pressure for delicate work. Built-in stand rests iron safely. Brilliantly chrome plated. Completely U. L. approved. Buy one at your dealer's today.**

FREE! *Write for booklet "TIPS ON SOLDERING"*

THE LENK MANUFACTURING CO.
30-38 Cummington Street, Boston, Mass.

IMMEDIATE DELIVERY!

Complete as shown



$24.95

F. O. B. ROYERSFORD, PA.

8" BENCH SAW

CUTS THROUGH 2 5/16"

UNCONDITIONALLY GUARANTEED ONE YEAR

Comes complete with Floating motor mount—miter gauge with adjustable stop—aluminum guard—soft aluminum insert—spring steel splitter—heavy gray iron fence—(no motor—no blade). Table 12" x 14". Tilts to 45°—Oilite bearings. Shipping Wt. 48 lbs.

AMERICAN MACHINE & TOOL CO. Inc.

DEPT. 200 **ROYERSFORD, PA.**

WRITE FOR FREE BOOKLET AND GUARANTEE BOND

Use it to save time and money *when you mow, plow, cultivate, disc, harrow, or plow snow.*

It's easy with a

PAGE
the streamlined Garden Tractor

Mowing grass or weeds is only one of many jobs you do quickly at low cost with a new Page. New "big tractor" features. *Headlight* and *equipment light* for night work. New quick-change hitch. Balanced for easy handling. Direct drive, worm-gear transmission, using cut gears and ball bearings. No cheap belts or chains. Gears and clutches in dust-free case. Adjustable wheels. Individual wheel clutches make turning easy. 1½, 2, 3, and 4 H.P. Backed by 20 years' experience. Write for dealer's name and free catalog.

Page Dairy and Farm Equipment
1916 S. 81st Street P-5 Milwaukee 14, Wisconsin

"Paint-it-Yourself" with **NU-ENAMEL** — ONE COAT COVERS — NO BRUSH MARKS

NU-ENAMEL DEALERS EVERYWHERE

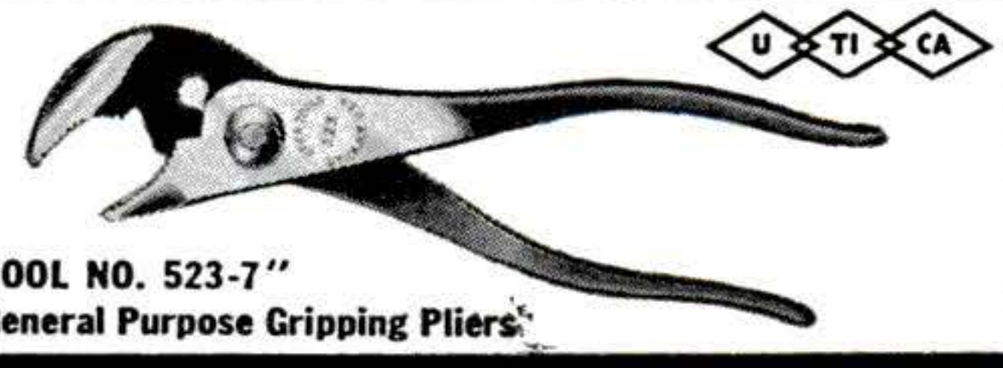
How to Drill Holes in Concrete in One-Tenth Usual Time

Revolutionary method shows you how to drill clean, sharp precision holes in concrete. Eliminates hammer noise. Saves up to 90% of cost per hole. Method is used by industry all over world to save time and money.

Send for FREE Illustrated Folder Today!

ROTARY CONCRETE DRILL COMPANY
650-52 S. Arroyo Parkway Pasadena 2, Calif.

UTICA TOOLS
FOR MORE TOOL MILEAGE



TOOL NO. 523-7"
General Purpose Gripping Pliers

UTICA DROP FORGE & TOOL
CORPORATION
UTICA 4, NEW YORK

Copyrighted material

NEW Amazing HOME UTILITY GUN!

GET ONE TODAY!

ASTONISHING MAGIC SUDS

A priceless new time and work-saver needed and wanted in every home. Precision made of finest materials. Nothing to wear out. Has innumerable uses.

Attach to Any Garden Hose

PAT. PENDING

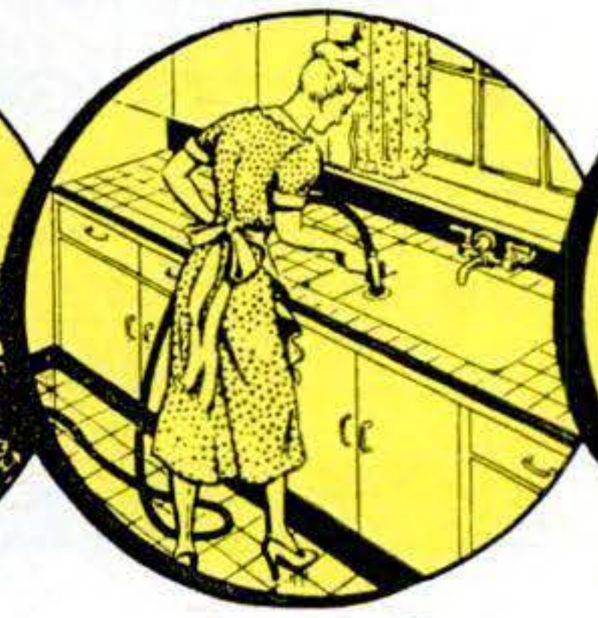
GLAZEWASH YOUR CAR

In 10 minutes for only 3¢

Here's effortless cleaning which produces a beautiful, streakless finish. Dries with a luster. No chamois needed. Gun handle holds enough GLAZEWASH to clean one complete car.

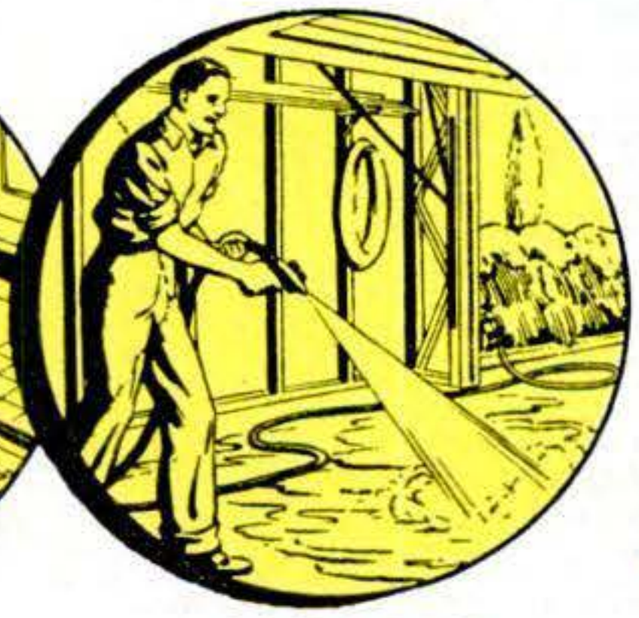
SUPERB GARDEN SPRAYER

Sprays liquid insecticides, fertilizers, weed-killers. No pumping necessary, no tank to carry, water pressure does all the work. Merely fill with desired solution . . . attach garden hose, pull trigger.



OPENS CLOGGED PLUMBING

When drain stops up, place rubber adapter in opening, place gun nozzle in adapter, pull trigger, and *Presto!!!* drain is opened and *really cleaned.* Pays for self in plumbing bills saved.



CLEANS GREASY FLOORS

Magically whisks grease and dirt from garage floors, driveways, porches, patios, etc. Washes outside walls, fences, screens, garden furniture! Many other uses in home and industry.

Only – $9.75

Complete Including

- 1 SPRAY-FOAMATIC, Jr. Home Utility Gun
- 1 Package Glazewash (Cleans 12 to 16 cars)
- 1 Package Utility Solvent (Makes 12 gals. all-purpose cleaning solution)
- 1 Garden Spray Adapter
- 1 Plumbing Drain Adapter

5 YEAR GUARANTEE

Extra pkgs. Glazewash only 45c ea. Cleaning Solvent 25c ea.

If your dealer can't supply you, order direct. . . .

MOTO-SWAY CORP., OF AMERICA
205 Pasadena Ave., South Pasadena, California

Send one SPRAY-FOAMATIC, Jr. Gun with Accessories, postpaid, for which find Check ☐, $9.75; send C.O.D. ☐ (I Pay Postage)

Name_____

Address_____
Please Print Plainly. Include Zone No.

SPRAY-FOAMATIC JR.

TRADE-MARK REG

Manufactured by MOTO-SWAY CORP., So. Pasadena, Calif.

One of America's Oldest Manufacturers of Quality Automotive Products

Copyrighted material

Get this Valuable BOOK

for Home
Playroom
Summer Cottage
or Camp

If You're Building Your Own Fireplace

HERE'S AN EASIER FOOL-PROOF WAY TO DO IT

Choose a design that will look well with the materials you have available. Prepare a concrete or brick slab the size of your fireplace. Center your FYRO-PLACE, the warm-air circulating form, on the base, and build around it. You will have a well-engineered, successful fireplace. You can't fail.

Book Also gives 10 Ideas for

OUTDOOR FIREPLACES

Now you can have the joys of an outdoor fireplace, at low cost. The FYRO-GRILL is a complete form around which you build your outdoor fireplace —simple or elaborate—as you wish, $19.95 at Buffalo.

WRITE FOR BOOK TODAY— Small book 4¼ x 5½ sent free. Larger book 8½ x 11, beautifully illustrated, 25c.

PRICE FIREPLACE HEATER & TANK CORP.
30 Austin Street, Buffalo 7, New York

DRILLMASTER
Power Drill

with Accessories

DRILL
GRINDER
POLISHER

only $7.95

Ideal for Particular Craftsmen. Beautifully designed aluminum die-cast body, 2 interchangeable chuck collets, cool running motor 3,000 R. P. M. 60 cycle, 110 V.-A. C. Cutler-Hammer slide switch, 6 ft. cord. - Steel saw, 3 bristle brushes, steel brush, felt and cloth polishing wheel, grinding wheel, emery discs and dressing stone.

SEND NO MONEY – FILL IN AND MAIL TODAY

MINOR MACHINE CORP.
45 North Division St., Buffalo, N. Y. DEPT. P. S.-1
Send Parcel Post, C. O. D. one Drillmaster Power Drill and Accessory Kit at $7.95.

Name _____

Address _____

Charges Paid if Money Accompanies Order

MINOR MACHINE CORP. 45 N. Division St. Buffalo, N. Y.

Semi-machined
DRILL CHUCK ARBORS

For fitting drill chucks and other tools to lathe spindle or turret head. Made of steel with ground shank. You machine to fit chuck or other tools.

SOUTH BEND LATHE WORKS
456A East Madison Street, South 22, Indiana

ARBORS with
No. 2 taper shank . . $0.85
No. 3 taper shank . . . 1.30
5/8" straight shank . . 1.15
3/4" straight shank . . 1.20

See your dealer – or sent direct postpaid.

SOUTH BEND

NEWEST OTTAWA LOG SAW

SELF-PROPELLED — MOVES ANYWHERE on OWN POWER

World's fastest Log Saw. Powerful 6 H-P air-cooled motor. Attachments for sawing down trees, buzzing limbs, post hole digging and pulley for belt jobs. Big demand for wood, pulp, posts. Make big money sawing wood this easy way. Low factory-to-user prices. Nothing like it. FREE details.

OTTAWA MFG. CO., 7-801 Pine St., Ottawa, Kansas

TRAILER BUILDERS!

BUILD or BUY . . . SPECIFY

• **Torq-Less Axles** • **Bull Dog Hitches and Parking Jacks,** ***Safety-Engineered by***
HAMMER BLOW TOOL COMPANY
D- 5 Wausau, Wisconsin

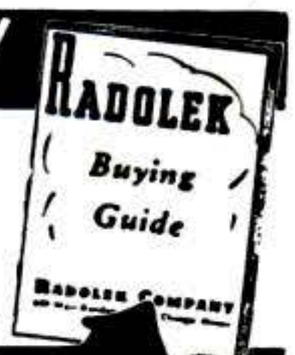
Send for FREE Catalog

In General-Purpose 4-Ohm Intermittent Tests
THE "EVEREADY" NO. 950 FLASHLIGHT BATTERY
OUTLASTS ALL OTHER BRANDS!

Everything in Radio!

Make **Radolek** your buying headquarters for Radio-Electronic repair and replacement needs. Large stocks assure finest, most complete selections of all available items at lowest prices. Your orders receive special attention for fastest delivery. Send today for FREE **Radolek Buying Guide.**

RADOLEK CO., Dept. A-068, 601 W. Randolph St., Chicago 6, Ill.

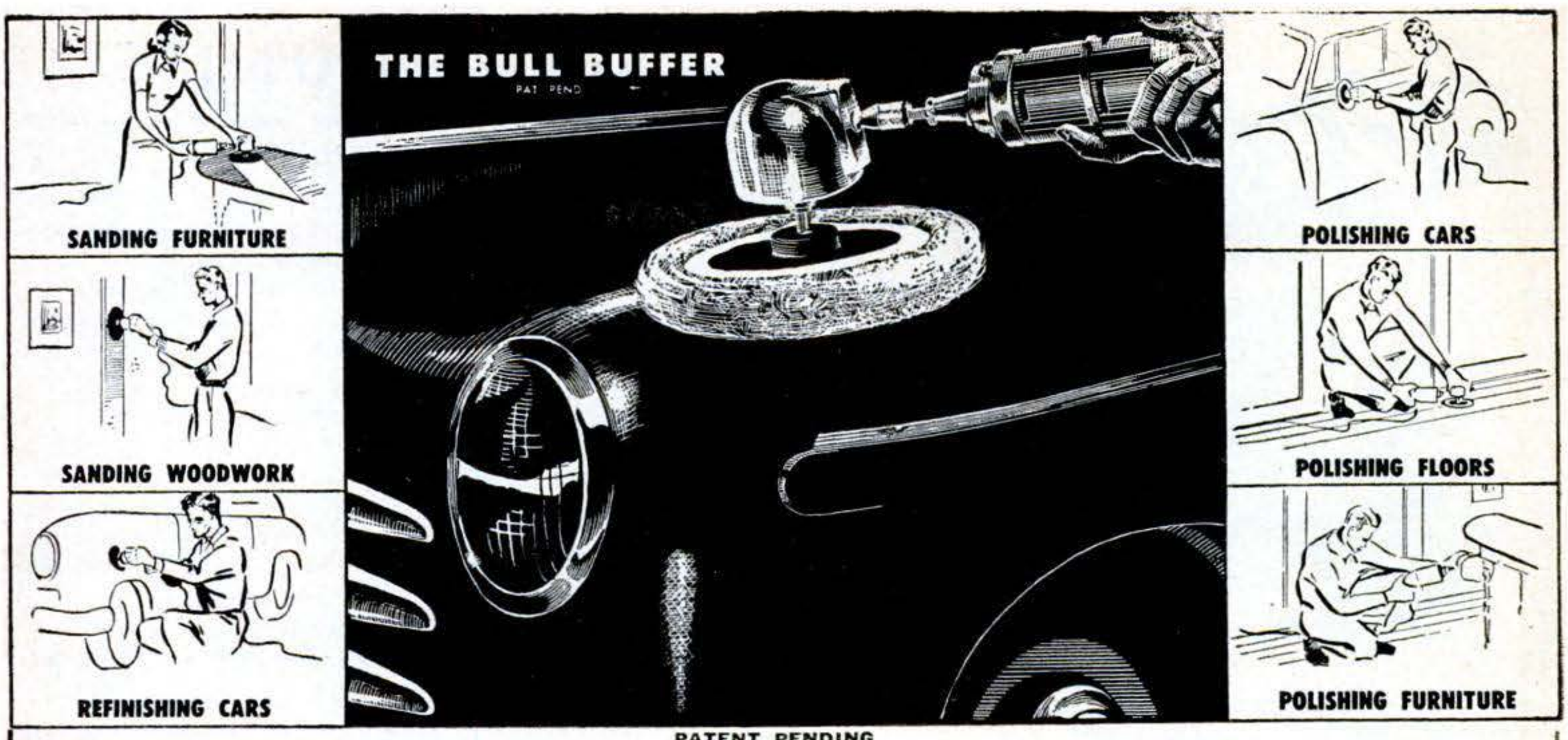


FREE RADIO BUYING GUIDE

YOU NEED THIS!

Today, tomorrow, next week—sometime—you wouldn't trade this tool for a hundred dollars. It's different—better than anything you have ever seen in its field—a hydraulic bumper utility jack that picks up loads from 8" below its base to 22" above, raises load a full 17". It's the famous American Hydraulic Bumper Utility Jack with chain and grab hook attachment. It's the bumper jack that's safe. Grab hook can't slip off bumper or bracket. Chain and grab hook pull fence posts, pipe, small trees, roots, forms, rocks. Hundreds of uses—and at all times the greatest tire-changing jack you've ever seen. 3,000 lb. capacity. If your dealer can't supply you today with the American with 30" chain and grab hook, write direct. Change tires safely, easily on any make car. Jack fully guaranteed. Order today. Enclose draft or money order for $15.95. We will ship immediately, post paid. Address: American Hydraulics, Inc., Sheboygan, Wis.

Copyrighted material



PATENT PENDING

Used in
HOME
FARM
FACTORY
GARAGE
OFFICE BLDG.
STORE
SHOP
SERVICE STATION
CABINET SHOP
METAL SHOP
UPHOLSTERING SHOP

The **very first time** you polish your car, sand your own floors, refinish furniture, this tool has **more than paid for itself.** And what a kick you'll get out of doing all the polishing and sanding jobs that used to cost lots of money! With the Bull Buffer, you can do beautiful, **professional** work—make your car, furniture, floors, woodwork gleam like new. You'll find no limit to the ways Bull Buffer will save time and money in your home and business.

THE BULL BUFFER FITS ANY CHUCK ON AN ELECTRIC DRILL (OR FLEXIBLE SHAFT). Attach it quickly . . . polish and sand . . . then disconnect it and use your drill for any other purpose.

HIGHLY MANEUVERABLE, EASY TO OPERATE. Holding drill stationary, buffer can be turned in a **complete circle.** Bull Buffer easily reaches **all curved or flat surfaces.** It's **RUGGED—POWERFUL—BUILT TO LAST A LIFETIME.** Sturdy aluminum casting houses self-lubricated bearings and steel gears that operate in a bath of oil. All materials and workmanship are **guaranteed**

The sooner you order, the sooner you'll have this handy new tool in your hands. It's a real bargain—only $9.95, **complete with five-inch rubber disc, sheepskin bonnet, and 2 sanding discs.** (Extra bonnets, $1.25—extra medium and coarse sanding discs, 10c each.) If your dealer doesn't stock, send cash, check or money order for $9.95, postage prepaid. C.O.D. plus postage. **$9.95**

BERTRUM B. ENGINEERING COMPANY

3034 MAIN ST. **KANSAS CITY, MO.**

DEALERS WRITE FOR INFORMATION

NEW 30" SHEET METAL BRAKE

Forms angles, channels, vees, flanges, locks, zees, boxes. Handles 26 gage sheet steel, heavier gages of aluminum, copper, plastic, etc. Portable. Can be held in a bench vise, or bolted down. All steel construction. Wt. 40 lbs. Shipped exp. collect. ONLY **$24.50**

12" BRAKE. Cast iron and steel construction. Forms difficult bends. $14.50 PP.

18" CURVE FORMER. Forms cylinders, round corners and cones in sheet metal and strap iron. Price, $10.00 PP.

VISE IRON BENDER. Forms rings, hooks, eyelets, etc. in ½" round or square; ¼" up to 2" wide in bar iron. Price $10.00 PP. With attachment to bend ½" pipe, $12.50.

Immediate delivery. Order direct, cash or C.O.D., or send for folder.

VISE BRAKE MFG. CO.
1318 So. 30th Ave., Dept. S6, Omaha 5, Nebr.

BUILD YOUR OWN BOAT

PACKAGED BOATS FOR HOME ASSEMBLY

Save 50%—build from our complete, easy-to-assemble plywood kits. All parts pre-cut, frames pre-assembled. Finest designs (8 to 18 ft.) available. $34.50 up. Send 25c (coin) for literature.

BOAT BLUEPRINTS & PATTERNS

60 finest plywood designs—large scale blueprints—full size patterns available—kayacks to cruisers—send 25c (coin) for design catalog or $1.00 for catalog plus booklet, "How to Build Plywood Boats."

MARINE MART—BUFFALO 7-A, N. Y.

Live in a House?

This light, strong, easily handled device—weight-tested to 500 pounds—will let you *Wash—Paint—Putty Your Windows—Hang Screens* and *Awnings—Service Combination Storm Windows without a Ladder!* Protective steel railing—wide substantial floor—rubber house protectors. Model H adjustable to all household wall thicknesses—9" to 17". $10.50 postpaid. $9.85 C.O.D. plus fee. Money back guarantee. Patents pending. A Morsafe* Product. Agents—Dealers—Territories Open. *Trademark

THEN YOU NEED A WindoStep*

FOR ALL OUTSIDE WINDOW WORK
...UPSTAIRS OR DOWN

An Ideal Gift

MORRISON CRAFTERS
703 Miami Street, Toledo 5, Ohio

NAME _____

ADDRESS _____

CITY _____ STATE _____

C.O.D. ☐ PREPAID ☐

PS-5 SEND CIRCULAR ☐

Copyrighted material

This Atlas 6″ lathe is America's lowest priced precision lathe. If your work comes within its 6″ swing, 4⅛″ over carriage, and 18″ between centers, you can machine just as quickly and accurately as on a larger lathe — and save many dollars. It has the same thorough engineering as the Atlas 10″ lathes. It is built to the same precision standards — checked by the same performance tests. Large bearing surfaces assure long-lived accuracy under heavy loads. Ask your Atlas distributor, or send for latest catalog, for full details.

*Price F.O.B. Kalamazoo, less motor.

ATLAS PRESS COMPANY
655 N. Pitcher St., Kalamazoo 13D, Mich.

Clip and Mail for Free Literature

ATLAS PRESS CO., 655 N. Pitcher St., Kalamazoo, Mich.
Send me literature about the 6″ LATHE and other Atlas Tools.

Name_____

Address_____

City, Zone, State_____

*SELSYN UNITS

(For use with Remote Weather Vane Indicator as described in POPULAR SCIENCE, p. 180, March 1948.)

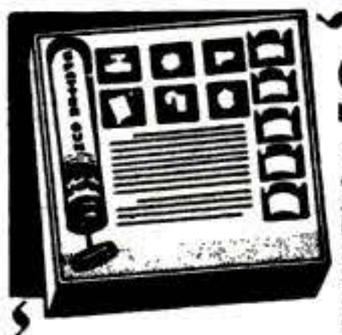
*Remote position indicator with an infinite variety of applications. Remote unit will indicate accurately the position of the rotor of the transmitting unit at any distance. Can also be used for light mechanical remote control applications.

Brand new units, manufactured by General Electric 2¼″ dia. by 3½″ long with 6/40 threaded shaft. Operate 35-40 volts A-C/60 cycles with transformer or with 60 watt light bulb or capacitor (greater economy and less heat) on standard 115 volt/60 cycle house line. Complete instructions, including capacitor for 115 volt/60 cycle operation.

STOCK NO. SEL-50 ..... **$3.95** Pair

Mail orders please include 30c per pair east of the Rockies, 50c west, for postage and handling.

DUBIN ELECTRONICS CO., INC., Dept. PS-6
103-02 Northern Blvd., Corona, N. Y.
Tel. HI 6-3066 • Send postcard for bulletins on "surplus" electronic equipt.



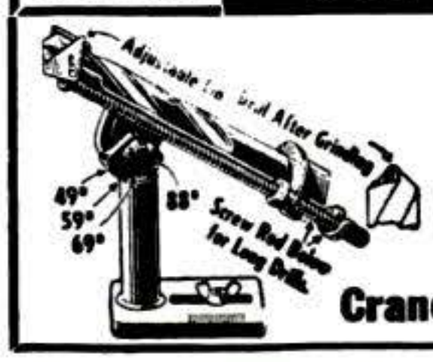
SPATTER CRAFT

• **Learn for fun & profit!** Produce color effects on wood, cloth, or paper impossible any other way. Sunfast, wash-proof, too. Kit has GUN; 5 BOTTLES of COLORED INK; STENCIL PAPER; many PATTERNS & DESIGNS; and 22-page TEXTBOOK in full color. Just $2.50 postpaid. CRAFT CATALOG FREE with order. (If W. Va. add 5c Sales Tax)

DWINNELL CRAFT SHOP, Dept. PS86, Elm Grove, Wheeling, W. Va.

NONE BETTER!

SUPER DRILL GRINDER



Sharpens round shank drills from 3/32″ to 1 1/16″ in diameter, up to 11″ long. Grinds old drills like new in 4 different point angles, using hand or power grinding wheels. Money-back guarantee.

Price only $2.95
At Dealers or Postpaid

Crandall Mfg. Co. 1512 W. Slauson, Dept. FB-30 Los Angeles 44, Calif.

AIR CORPS Type P23 Headphones

AT A FRACTION OF ORIGINAL COST
8000 ohm impedance, bipolar magnets. Extremely comfortable sponge rubber cushions, stainless steel leather covered headbands, concealed terminals. **6 ft. cord with PL55 plug. BRAND NEW.** $15.00 Value.
No. 5A134 Spec. Per Pair..... $2.95 **Plus 25c each for Postage.**

FREE Catalog on Everything in Radio and Electronics.

Burstein-Applebee Co. 1012 McGee, Kansas City 6, Mo.

YOU CAN BUILD anything on wheels!

Build your own soapbox racers, wheelbarrows, toy wagons and carts, utility trucks, bike trailers, etc. with the new

PALMER COMPLETE WHEEL KIT

Everything complete: 2 sturdy, steel, molded rubber tired wheels, bright red baked enamel finish; 2 steel brackets; steel yoke, welded axle; rustproof; plated steel nuts; easy to assemble, complete instructions. Stands up to 1000 lb. load.

Send check or money order. Shipments F.O.B. Cleveland 9, Ohio.

FULL MONEY BACK GUARANTEE

CONNIE-BERT CO. 8115 Clinton Rd., Cleveland 9, Ohio

Copyrighted material

FREE ➡ 10 Official Ranger Rifle targets
➡ Descriptive Folder telling how you can become a sharp-shooting Ranger

You can win a Ranger Shooting Emblem with the 22 rifle you have now. No special equipment needed. Just put up the target on a safe backstop and start shooting. Send for 10 free official targets and free folder today!

HERE'S WHAT THE FOLDER TELLS:

How to be a RANGER—How to get the 3-inch orange, silver and black shooting emblem—How to "play safe" with a gun—How to get more free literature (tips on shooting, expert's advice)—How to start a RANGER Rifle Club.

·N·R·A· RANGER

SPORTSMEN'S SERVICE BUREAU, Dept. R.P.S.-6
343 Lexington Avenue, New York 16, N. Y.

Please mail to me *free* and *without obligation:* "How To Be An N. R. A. (National Rifle Association) RANGER," and 10 official RANGER targets.

Name _____

Street _____ City _____

Zone _____ State _____

This advertisement sponsored by **REMINGTON ARMS COMPANY, INC.**
BRIDGEPORT 2, CONN.

BUILD ARC·WELDER

For Light or Heavy Work. Has 20 heats. Uses old auto generator coils. Rewinding unnecessary. Works on 110 or 220 volts AC. **Complete Plans** 35c including Catalog of Electrical Bargains. **LEJAY MANUFACTURING CO.**
3323 LeJay Bldg., Minneapolis 8, Minn.

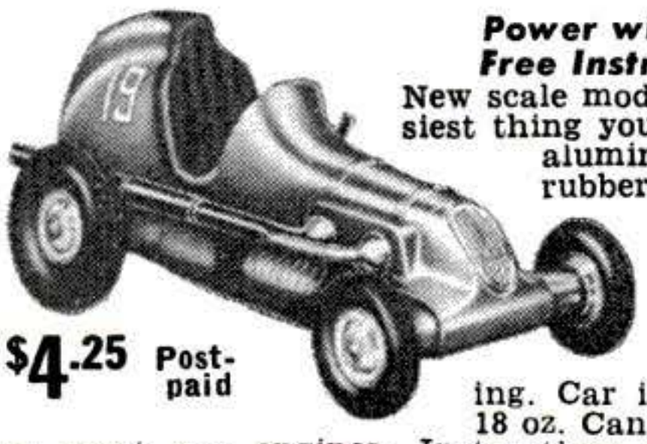
---

6 NEW GADGETS FOR $1.00

Preview the newest inventions of America's "gadgeteers." One dollar brings you SIX new, patented, exclusive gadgets—one a month for six months! Get them before public sale anywhere. Send $1.00 today to
GADGET OF THE MONTH CLUB, INC.
P. O. Box 2000 **Los Angeles 54, Calif.**

Speed Thrills! MINIATURE RACING with JET POWER and ENGINES

THIMBLE DROME RACER

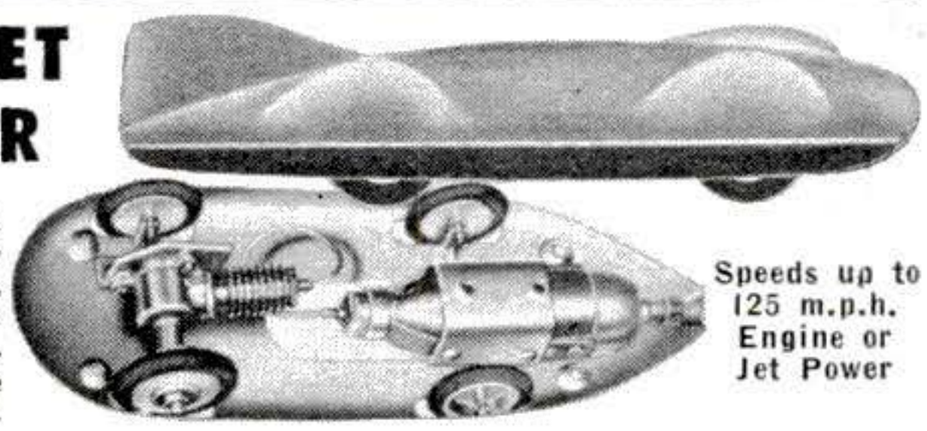


Power with Gas or Jet Engine. Free Instructions with Each Car

New scale model of midget racer, the classiest thing you ever laid eyes on. Die Cast aluminum body, turned aluminum, rubber-tired wheels with treads. Chrome exhaust stacks. Wobble pump. Simulated leather seat and back. Instrument panel and numbers. Equipped with bridle lugs for cable track racing. Car is $9\frac{3}{8}$" long, 4" high, weighs 18 oz. Can be powered with CO_2 engine or most gas engines. Instructions accompany each car. Only $3.95. Postage 30c additional.

$4.25 Postpaid

GAD-JET RACER



All metal miniature racer, ultra streamline design. Aluminum, die cast, two-part body, aluminum wheels, rubber tires. Completely finished, ready to go, with clip for jet cartridge racing, only $1.50. Same, with OK CO_2 engine and conversion kit for installing engine at home, $6.95. Add 20c for postpaid delivery either model.

Speeds up to 125 m.p.h. Engine or Jet Power

Rush Order to Address Below. If you prefer C.O.D. Delivery send $1.00 deposit with order.

HOME SHOP PRODUCTS COMPANY, Dept. 2A, 4821 Sheridan Road, Chicago

Copyrighted material

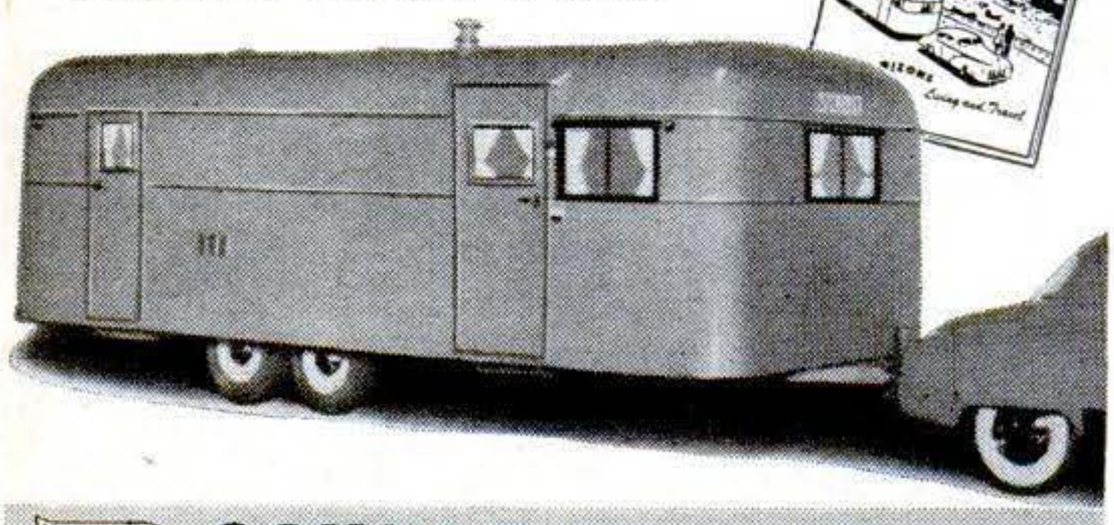
You'll be Glad

YOU BOUGHT A SCHULT

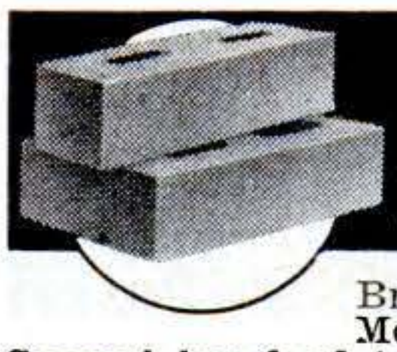
IT'S "TOPS" FOR LIVING AND TRAVEL VALUE!

Wherever you take your Schult, you'll have every facility of a completely furnished, well-insulated, all-season *home.* Backed by more than a decade of research, your Schult is a *quality* product . . . it offers many *plus-values* that add to comfort and privacy. Ask your Schult dealer, *now,* to show you latest livable 1948 models. Schult Corporation, Dept. 3106, Elkhart, Indiana. *In Canada:* John Inglis Co., Ltd., Toronto.

Free Illustrated catalog with full details of 1948 Schult models...also name of nearest dealer.



SCHULT *Trailer Coaches*



More Local Manufacturers are Needed-NOW

Brikcrete is sweeping the country. More local plants are badly needed. Several hundred territories are being opened up for local Brikcrete manufacture by men of vision and aggressiveness. Brikcrete ties in with today's huge building program. Makes possible better construction at lower cost. Truly better than brick; actually cheaper than lumber. Combines strength, safety, insulation value, colorful beauty.

World's Most Modern Masonry

Brikcrete is made in locally owned plants, using local materials and local labor. That's why high quality and low price still permit a 100% to 150% mark-up. We supply complete equipment; easy terms if required. Generous cooperation. Exclusive manufacturing privileges in protected territory. Write or wire for information.

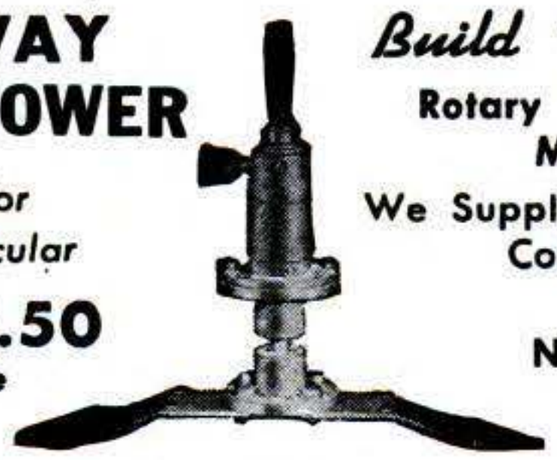
BRIKCRETE ASSOCIATES, INC.
4675 S. Division, Grand Rapids, Mich.

BRIKCRETE

NU-WAY LAWN MOWER

Write for FREE *Circular*

Price **$12.50**
Why Pay More



Build Your Own
Rotary Type Lawn Mower
We Supply Cutting Unit Complete.

NO INCREASE IN PRICE

TRACTOR-LITE MFG. CO., SPIRIT LAKE, IOWA

PALMGREN Rotary, Indexing, Milling TABLE

DUAL CROSS FEED and ROTARY FEED

Has 8" table. 360° movement and 4" cross feed travel. Adjusting wheels and dials graduated in degrees and thousands. Slotted for bolting to table. **No. 83** Priced **$49.50. No. 82** without rotary feed **$39.75.**

No. 83

Write for Circular No. 10

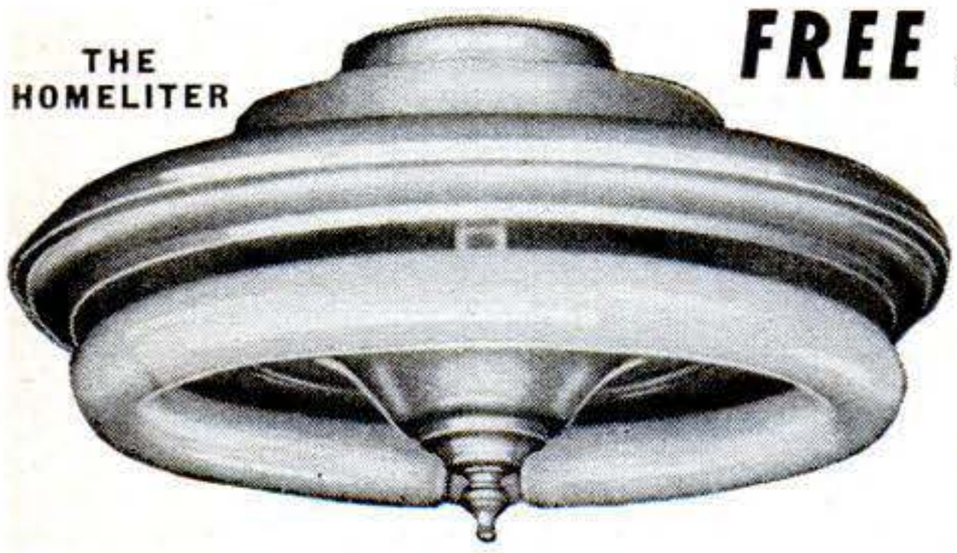
CHICAGO TOOL and ENGINEERING CO.
8396 South Chicago Ave., Chicago 17, Ill.

---

22 Big Money-Makers in a Single Line!

Amazing New Fluorescent Lights with *CIRCULAR TUBES*

THE HOMELITER



FREE SALES OUTFIT

• Don't send a penny. Sample Outfit is FREE. Rush name on penny post card for money-making facts about sensational new "CIRCLINE" Fluorescents. Latest scientific development gives you **22** new type circular tube fixtures for kitchens, dinettes, halls, and play rooms. Also Floor and Table lamp for living rooms and pin-ups for shaving and vanity tables. Sells on sight to homes, restaurants, stores, offices. No other fluorescents like CIRCLINE. Salesmen who order samples quickly reorder in large quantities. **All fixtures complete with tubes.** No waiting. Also **immediate delivery** on all standard type Fluorescent Fixtures. This is too good to miss. Big, quick profits waiting. Rush name on post card today for FREE Sales Outfit.

NEW MAXILUME PIN-UP MIRROR LIGHT

MAXILUME COMPANY • 125 W. Hubbard • Dept. 96 • Chicago 10, Illinois

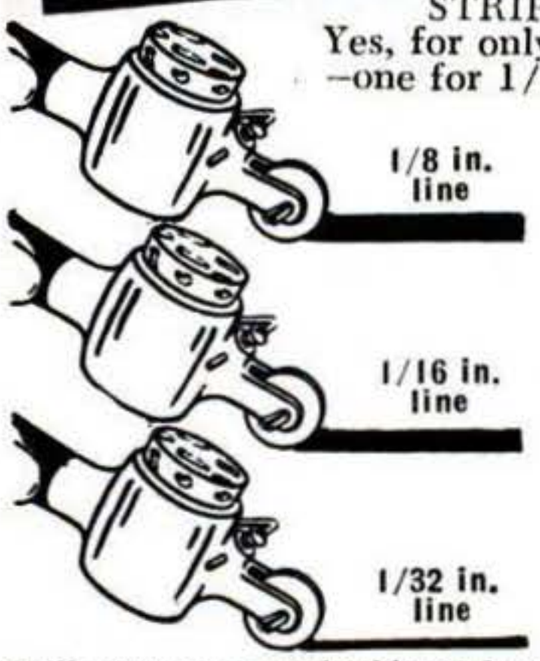
Copyrighted material

LOOK! 3-PIECE PAINT STRIPE SET

Only $1.00 for Set of 3

Each Tool Makes Different Thickness

Hobbiests! Painters! Home craftsmen! Here's the paint-striping set you want —three different tools, each one making a *different* thickness of line—AND THE COMPLETE SET OF 3 PAINT-STRIPING TOOLS, ONLY $1.00! Yes, for only $1.00 you get 3 separate tools —one for 1/8" lines, another for 1/16", and another for 1/32". Stripe lines with any paint, lacquer, or enamel—straight, circular, or wavy—to beautify furniture, toys, signs, autos, bicycles, walls, panels, etc. Make imitation tile. Use different colors. These paint-stripe tools are as easy to use as drawing with a pencil along straight edge. Everything complete. Nothing else to buy. Full simple instructions included.



SEND NO MONEY

Mail your name and address for 3-piece Paint-Strip Set of tools. Pay postman only $1.00 plus postage. Use 5 days. If not delighted, return set and money will be refunded. Order now.

STRADER MFG. COMPANY 259 Strader Ave., Dept. A-352 Cincinnati 26, Ohio

MAKE $ MORE MONEY

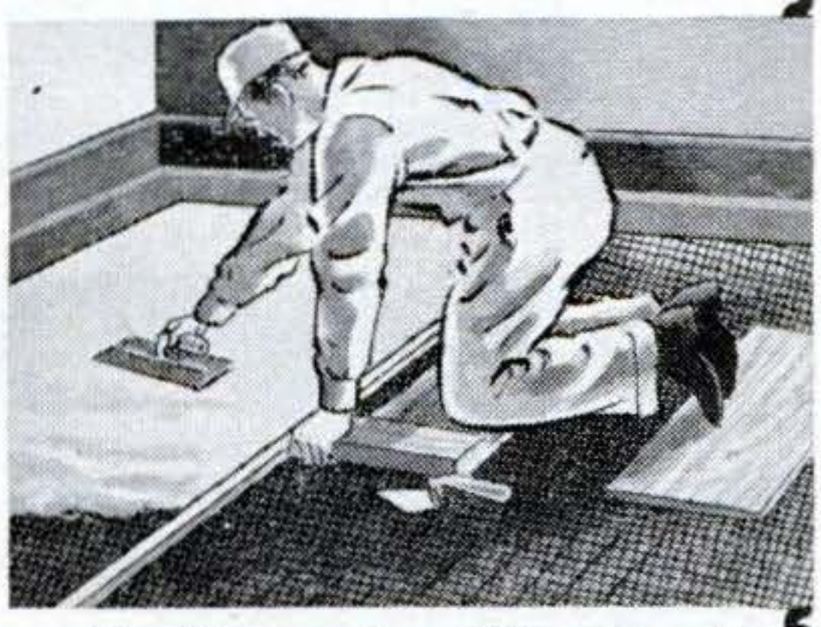
Applying or Selling

CORKSTONE

A General Purpose Magnesium Oxychloride Flooring

THE MODERN PLASTIC FLOORING

EASY TO APPLY Here's your opportunity to get into business for yourself applying or selling Corkstone, the economical, top-grade plastic flooring. Plenty of profit. Act without delay!



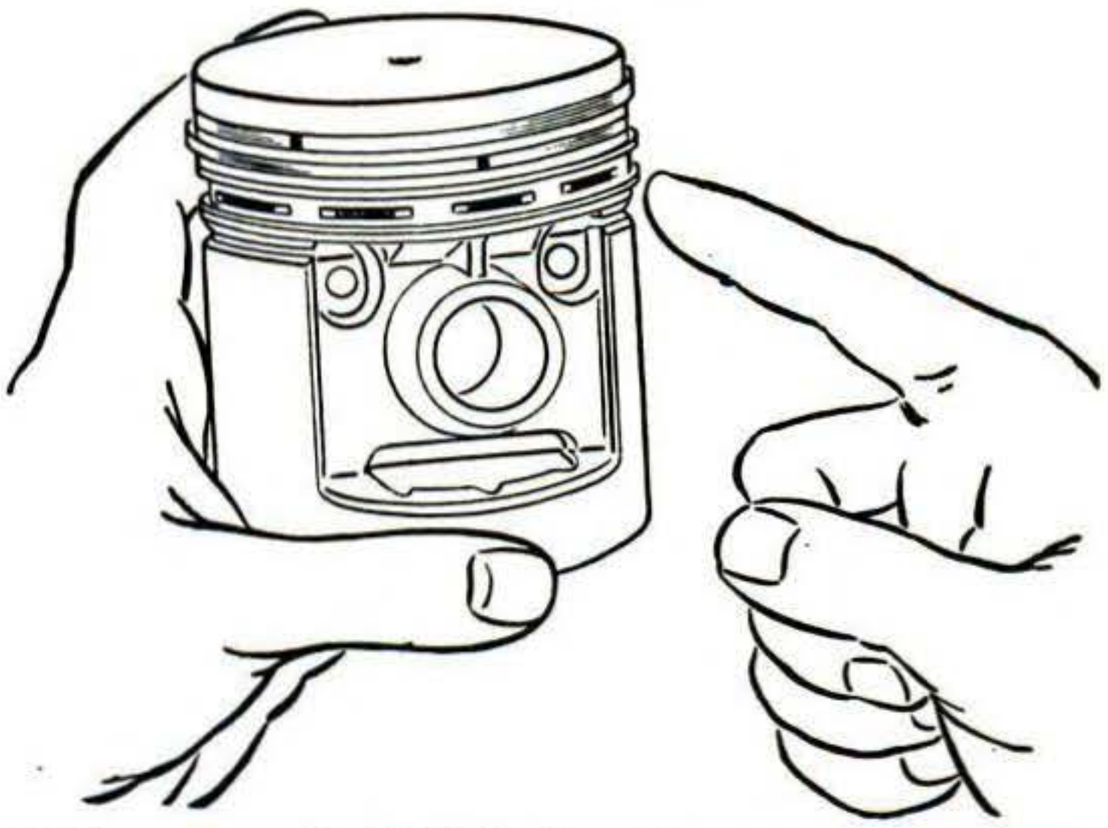
Dealers & Agents Wanted

WRITE FOR DETAILS

LASTING PRODUCTS COMPANY
200 Block S. Franklintown Rd., Baltimore 23, Md.

DON'T YOU BELIEVE IT!

... THAT ANY OLD PISTON RING WILL DO



● Some people think it doesn't matter what piston rings they use in their cars. But the truth is, there's a great difference between brands. And there are good reasons why Burd Piston Rings are better. Burd uses an individual pattern for each type of ring and each ring is individually cast from Burd's own electric furnaces. Further refinements are accomplished by accurate machining plus a careful "Graf-Flox" finishing treatment. These scientific methods are your guarantee that each type of Burd Piston Ring has just the right degree of hardness, flexibility, and tension for its specific use. Burd "Graf-Flox" Piston Rings *stop* fuel and oil losses . . . *restore* pep and power to your car. Mail coupon below for further facts.

BURD PISTON RING CO., ROCKFORD, ILL.

BURD

AUTOMOTIVE **PRODUCTS**

"Engineered for results"

MAIL THIS COUPON FOR THESE *FREE* BOOKLETS

BURD PISTON RING CO., DEPT. 128-F
Rockford, Illinois

I'd like copies of your "Servicemen's Handy Handbook" which tells how to keep my car in good working order, and the booklet "No Job For a Dub."

Name.....

Address.....

City..... State.....

Copyrighted material

NEW MILANO

IMPORTED BRIAR
with "LOCKMOUNT"

Famous Milano pipe with added feature ...*Lockmount* Hesson Guard. It *screws* into bowl for tighter, firmer fit. Stops goo! Mister, if you want a pipe that always stays clean and dry, get a Milano!

WDC

$1.50
IMPORTED BRIAR

WM. DEMUTH & CO., INC., NEW YORK 22

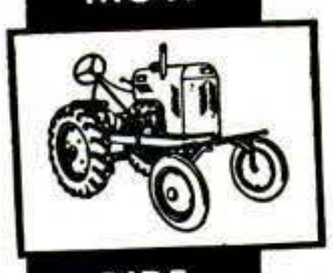
SAVE TIME, WORK, MONEY!

SHAW "DU-ALL" and "PEPPY PAL" TRACTORS

PLOW

CULTIVATE

MOW



RIDE

These rugged walking or riding tractors ideal for farm, truck garden, orchard, poultry farm. They operate on a few cents an hour. A child can handle them.

DO DOZENS OF JOBS

The Shaw Du-All or Peppy-Pal does many jobs quickly and easily. Plows, cultivates, harrows, disks, bulldozes, sprays, hauls, grinds, and saws wood.

BUILT FOR RUGGED WORK

Sturdy, extra-strength construction means low upkeep, long life. Full year's guarantee.

LOW FACTORY PRICES

Buy direct or through your dealer! Almost anyone who owns a garden can afford a Shaw Du-All or Peppy Pal. Mass production holds prices down, —quality up.

RIDING TRACTORS

4 models, from 5 to 12½ H. P., 58 in. wheelbase, 36 in. wide, 24 in. plant clearance. Hand or electric starter. Improved steering device, brakes enclosed in differential housing. Heavier frame and bearings. Standard hitch for trailers and wagons. Plow, harrow, cultivator, cutter bar, snow plow, bulldozer available.

RW-1

FREE: Illustrated folders giving complete details and price lists—write today!

SHAW MFG. CO.

5706 Front St., Galesburg, Kan.
668 PS North 4th St., Columbus, O.

COMPLETE *FLEXIBLE SHAFT* MACHINE only $19.95

WITH PENCIL-SIZE HANDPIECE for "FINGER-TIP" CONTROL. Performs countless tasks quickly, easily! Use FOREDOMS on wood, metal, glass, plastics, etc. Provides easy accessibility, unobstructed view. Grinds, polishes, drills, mills, engraves, sharpens, slots, sands, carves, etc., etc. Complete $19.95. No. 50 Accessory Set $1.50 additional. **Order today. FREE CATALOG.**

FOREDOM ELECTRIC CO., Dept. F-107, 27 Park Pl., N. Y. 7

LAW

STUDY AT HOME for Personal Success and LARGER EARNINGS. 39 years expert instruction—over 114,000 students enrolled. LL.B. Degree awarded. All text material furnished. Easy payment plan. Send for FREE BOOK NOW—"Law and Executive Guidance."

AMERICAN EXTENSION SCHOOL OF LAW
Dept. 90-PS, 646 N. Michigan Ave., Chicago 11, Ill.

Safe! FOR FAST BATTERY CHARGING

START YOUR OWN BUSINESS

Sell nationally advertised, portable, fast battery charger-compressors to service stations, garages, car lots, fleet owners, farmers. Amazing low price, big discounts. Valuable territory still open. Wire or write now to...

H&H PRODUCTS MFG. CO., Dept. PS-3, 306 Boyd Street, Los Angeles 13, California

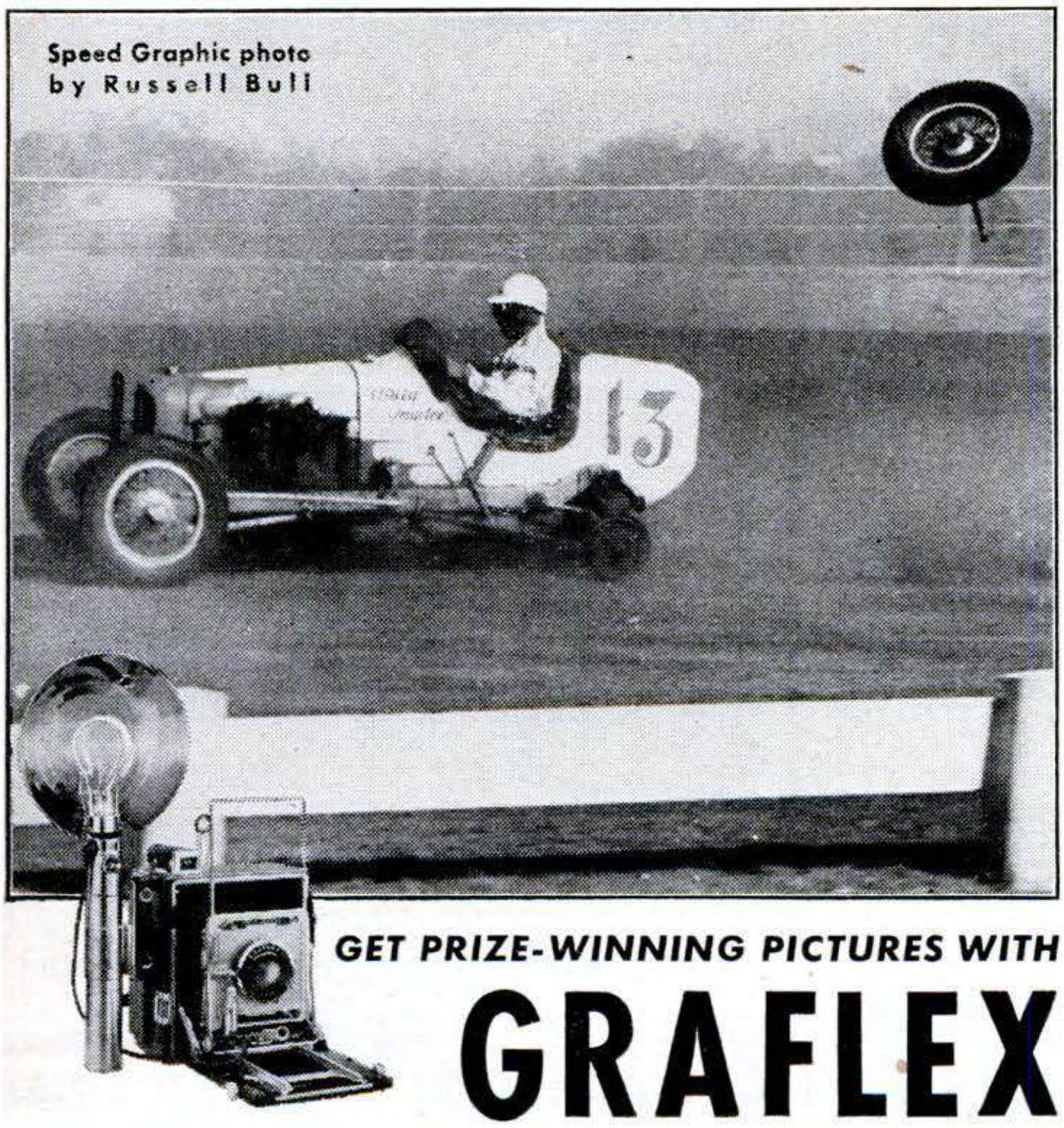
"I'LL TAKE THE WHITE ONE EVERY TIME!"

WYTEFACE
TRADE MARK
STEEL MEASURING TAPES

K+E
KEUFFEL & ESSER CO.

Copyrighted material

IF YOU CRAVE ACTION YOU WANT THE *Pacemaker* SPEED GRAPHIC!



GET PRIZE-WINNING PICTURES WITH

GRAFLEX

You want the one camera that does justice to a hobby that can be the most exciting in the world! Events that are packed with action take place every minute in every day. And *you* can get an everlasting record of *action*—sports, public events, racing fire-fighters—with the SPEED GRAPHIC . . . the camera press photographers use!

That's because the SPEED GRAPHIC is the camera with the new, simplified focal-plane shutter with governed speeds—and governed speeds mean *accurate* exposures, and more and better pictures! The camera that takes any kind of picture with the greatest of ease! See your dealer today! For descriptive literature, write to Room 31, Graflex Inc., Rochester 8, New York.

Graphic cameras and accessory photo-products are manufactured only by Graflex, Inc., Rochester 8, New York.

Western Division Office: 3045 Wilshire Boulevard, Los Angeles, California

---

SEND FOR FREE CATALOGUE AND MANUAL

MP QUALITY

Aluminum Guard Easily Removed For Dadoing

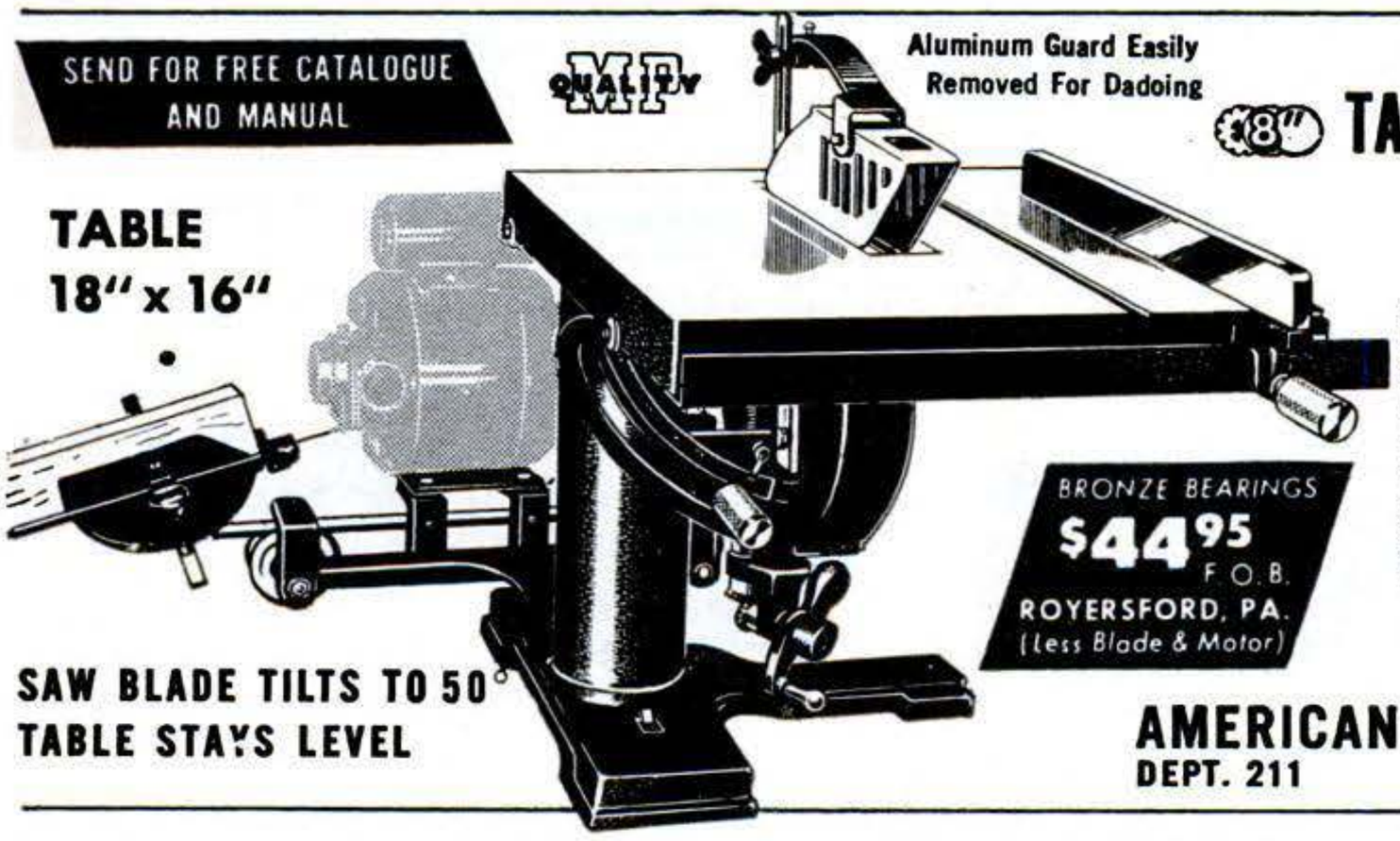


TABLE 18" x 16"

SAW BLADE TILTS TO 50°
TABLE STAYS LEVEL

BRONZE BEARINGS
$44.95 F.O.B.
ROYERSFORD, PA.
(Less Blade & Motor)

NEW IMPROVED

8" TABLE MODEL TILT-ARBOR SAW

OIL IMPREGNATED BRONZE BEARINGS OR DOUBLE SHIELDED BALL BEARINGS, BOTH WITH THE PATENTED BALL BEARING TRANS-AXIAL MOTOR DRIVE

MODEL #2021X AS SHOWN WITH COMPLETE MITRE GAUGE. Precision etched scales show angles on mitre gauge and saw cradle. STEEL BAR RIP FENCE. ALUMINUM SAW INSERT AND GUARD. STEEL SPLITTER. BALL BEARING TRANS-AXIAL DRIVE 5/8" GROUND ARBOR. "COMPO" OIL IMPREGNATED BRONZE BEARINGS WITH OIL CHAMBER AND CUP, (OR, DOUBLE SHIELDED BALL BEARINGS, $5 EXTRA). TABLE 18" x 16". BUILT IN SWITCH. Depth of Cut 2 5/16". Shipping Wt. 110 lbs. Requires 1/3 or 1/2 H.P. Motor.

(BALL BEARING FLOOR MODEL WITH 18" x 32" TABLE INCLUDING EXTENSION . . . . . $79.50)

AMERICAN MACHINE & TOOL CO., Inc.
DEPT. 211 ROYERSFORD, PA.

FREE Sample Of New PLASTIC Shows How To Make Leather *and* Leatherette *LIKE NEW!*

MAGICALLY CHANGES CLOTH TO IMITATION LEATHER

SAVE MONEY - TIME AND EFFORT by renewing Luggage—Leather Covered Furniture—Golf Bags—Auto Seat Covers—Restaurant Furniture, Booths or any Leather or Leatherette item with new plastic discovery called Leather-New. Coat cloth or cloth covered items such as Glider Cushions, Tarpaulins, Porch Furniture, Etc. and make them look and wear like they were leather. Spreads easily with brush or spray gun—leaves NO BRUSH MARKS. Simple Acids, Caustics and Alcohols do not stain this finish—It is sun and mildew proof. Stays Fresh and Clean as long as real leather. Comes in all standard colors. Just mail coupon for Free sample of Leather-New coated material which shows effects.

OWN A PROFITABLE LIFETIME BUSINESS

Cash in on big profits to be made in this new business—Profits up to $700.00 monthly possible, renewing booths and furniture for bars, restaurants, grills, movie houses, etc. Mail name and address on 1c postcard—I'll show you how. **Jack Edwards, Sales Mgr.**

LEATHER-NEW PRODUCTS, 4723 Troost, Dept. S-2, Kansas City, Mo.

JUST MAIL COUPON
No Obligation

Leather-New Products,
4723 Troost, Dept. S-1, Kansas City, Mo.

Name . . . . . .

Address . . . . . .

City . . . . . State . . . . . .

Fill Out—Mail Today

Copyrighted material

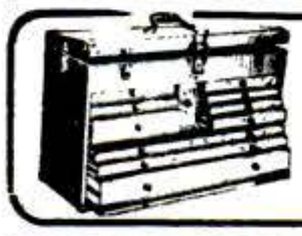
THE CHAMPS SET THEIR RECORDS WITH LOUISVILLE SLUGGERS

Every important batting record in Baseball has been made with a Louisville Slugger bat. Look for the H&B oval trademark and a famous player's written signature on the barrel end.

The 1948 edition of H&B's Famous Slugger Year Book is ready now. Get your copy from your Louisville Slugger dealer or send 5c direct to us (stamps or coin) to cover mailing. Address Dept. Z-34, Hillerich & Bradsby, Inc., Louisville 2, Ky.

LOUISVILLE SLUGGER HILLERICH & BRADSBY CO. LOUISVILLE KY.

Louisville SLUGGER BATS
FOR BASEBALL & SOFTBALL



GERSTNER Tool Chests

Better, finer **Gerstner Chests** are preferred by good machinists and toolmakers everywhere. Free catalog.
GERSTNER TOOL CHESTS
548 Columbia St. Dayton 7, Ohio

GOOD NEWS FOR THE DEAFENED!

● Find out how new all-in-one Western Electric Hearing Aids offer you finer hearing . . . real operating economy . . . plus many important exclusive features designed by Bell Telephone Laboratories. Send for free booklets giving full details.

FREE! MAIL THIS TODAY

Western Electric, Dept. 380-PS6
195 Broadway, New York 7, N. Y.

Send me the illustrated booklet about two new all-in-one Western Electric Hearing Aids. Include my free copy of "Modern Science and Your Hearing."

Name_____
Address_____
City_____ Zone____ State____

Distributed in Canada through Northern Electric Co., Ltd.

THE FAMOUS LENK Gun-Grip

Electric Soldering Iron
WITH 4 SPECIAL USE TIPS

IDEAL FATHERS DAY GIFT (Postpaid) **$4.95**

● PERFECT BALANCE ● CHROME PLATED—HANDSOMELY PACKAGED
● 4 TIPS FOR VERSATILITY ● UNIQUE BUILT-IN SAFETY STAND

It's New! It's the perfect gift! For Hobbyist, Mechanic. Novice! Longlife electric soldering iron for heavy or fine work, 9¼" long; 75 watt; 110-v AC-DC; 6' cord; UL approved. Plastic cool-grip GUN-GRIP—a handsome gift for "Him"! Includes free booklet: "How To Solder" Check or Money Order; Sorry no C.O.D.s
ORDER BY MAIL — MONEY BACK GUARANTEE

S. STEVENS CO., INC. 199 WASHINGTON STREET R 801, BOSTON 8, MASS.

TALK ANYWHERE!

TO ANYONE—ANYTIME!

New low cost system needs NO ELECTRIC PLUG-INS—No TUBES—SIMPLE—INSTALL YOURSELF IN A FEW MINUTES. Beautiful Walnut-Silver Plastic Cabinets—SITS ON DESK OR HANGS ON WALL! GIVES REAL LOUDSPEAKER VOLUME. NOT A PHONE!

SERVICE GUARANTEED 3 YEARS

2 way system complete with wire $19.95. Also up to 7 way units $12.95 each. FOR HOMES, FARMS, STORES, OFFICES, CAFES, ETC. FREE DETAILS. WRITE—
PAKETTE PRODUCTS CO., INC., Dept. EPS-6, KEARNEY, NEBR.

★ **FREE** JUST OFF THE PRESS
BARGAINS GALORE

- Aviation Operators
- Inventors
- Model Builders
- Industrialists
- Home Craftmen

(Send Stamp)

MILLIONS of AVIATION SURPLUS ITEMS

AERO PARTS SUPPLY CO.
'World's Largest Suppliers of Aircraft Spares'
Municipal Airport
HOUSTON, TEXAS

Genuine Snap-on Tools

Available Only Through Snap-on's Direct-To-User Tool Service
WRITE FOR INFORMATION
SNAP-ON TOOLS CORP. • Kenosha, Wisconsin

Guides you to hobby happiness

Woodworking handbook and catalog of HOMECRAFT® Power Tools

Send for your copy today!

10¢ Postpaid

Shows how you can have a complete home shop without spending a lot of money! Gives you useful information: Plan for woodworking bench. Handy hints on using a band saw. Reference charts on screws, bolts, board measure. Dimensions for power-tool stands. Method of enlarging plans and drawings. Names of helpful books. Get your copy of Catalog HC-1!

Ask us for your Homecraft dealer's name.

DELTA MFG. DIV., 683F E. Vienna Ave., Milwaukee 1, Wis.

Copyrighted material

IT'S NEW!

Crosman "Bullseye" TARGET PISTOL

Here's new fun for shooters! For the new Crosman "Bullseye" offers adjustable "power without powder" for accuracy with safety indoors and out! No noise, no recoil, no odor, no cleaning! Perfect balance! Rifled barrel! Fine gunsmithing! Low cost! THAT'S what you get in this new .177 cal. single-shot pistol of regulation target type and weight. Shoots Crosman Super-Pells at ¼ cent per shot. No wonder they say no other pistol provides so much fun at such small cost. At your sporting goods or hardware dealer's . . . or write direct.

Crosman *Silent* RIFLE

. . . most amazing gun ever invented for target shooting indoors or out and for small game! Adjustable "power without powder" . . . no noise, recoil, odor or cleaning. Rifled barrel. Shoots low-cost Super-Pells. .177 or .22 cal. single-shot or magazine models. At your dealer's . . . or write direct.

CROSMAN ARMS CO., INC.
9 HENRIETTA ST. • ROCHESTER 7, N. Y.

HAPPY HOURS

and Miles of Fun with a

HARLEY-DAVIDSON

This year take a vagabond vacation! See America's outdoor wonderland from a new and thrilling vantage point . . . the saddle of a smooth-riding, fleet-footed Harley-Davidson! Discover the delights of "gypsying" along strange highways, of roaming down wilderness byways . . . with a pal or a gal, and the whole world unfolding before you! Visit scenic splendors, faraway places — take in exciting race-meets, endurance runs, hillclimbs. Make your holidays happier, every spare moment memorable, in the world's greatest sport . . . motorcycling! See your dealer today. Mail coupon now.

HARLEY-DAVIDSON MOTOR CO.
Dept. PS, Milwaukee 1, Wis.

Send free copy of ENTHUSIAST magazine, filled with motorcycle action pictures and stories; also literature on latest models.

Name.....

Street or R.F.D.....

City.....Zone.....State.....

Copyrighted material

NOW you can PREVENT RUST and SCALE from forming in your AUTO RADIATOR

KEEP WATER CRYSTAL CLEAR. Installed in radiator hose, Butler De-Scaler's Galvanic Cell Action prevents RUST and SCALE throughout the entire cooling system. Causes the removal of OLD RUST AND SCALE.

PROTECT your new car's cooling system from the start . . . end radiator rust-ups in your old car. Butler De-Scaler has been used with great success industrially for over ten years . . . proven in thousands of truck and bus fleets. Now available for car owners. Unconditionally guaranteed . . . for one year . . . will not interfere with Anti-freeze or stop leak. Easily installed . . . available at service stations, garages, and car dealers everywhere. If no dealer near you, write BUTLER ENGINEERING CO., 2624 Rousseau St., New Orleans 11, Louisiana.

New Fair Trade List Price $2.95

Butler De-Scalers are also available for use in boilers, home hot water systems, Diesels, etc.

BUTLER De-scaler

A TOOLSHOP IN YOUR HAND

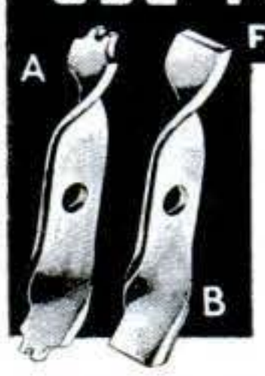
THERE'S ONLY ONE GENUINE HANDEE

First tool of its kind—today's finest. Smooth, steady power at your fingertips. Easy to handle. Make ship, plane and train models, bookends, costume jewelry. Grinds, drills, polishes, routs, carves, sands, saws, engraves on metal, wood, plastic, glass, leather, etc. 25,000 r.p.m. AC or DC. Wt. 12 oz. With 7 accessories $20.50. In case with 40 accessories $27.50. At stores or sent postpaid. A fine gift for a friend or yourself. CHICAGO WHEEL & MFG. CO., 1101 W. Monroe St., Dept. PO, Chicago 7, Ill. Free 52-page manual.

HANDEE TOOL OF 1001 USES

USE YOUR BENCH SAW

FOR JOINTING & CUTTING MOULDINGS



With our six inch tool steel cutters make mouldings, casings, drop-leaf tables, grooves beading and jointing. Moulding cutters, A 1 in. wide $1.50. 1½ in. $2.00. Jointing cutters, B 1 in. $1.50. 1½ in. $2.00. E 1 in. for drop-leaf tables, $1.50. E 1½ in. Makes ¾ in. cove & Quarter. $2.00. Postpaid. Guaranteed. State size hole. List & Folder free.

JOHN A. SANDSTROM
Rt. 1-P. Clearwater, Fla.

Treasure and Mineral LOCATORS

Low priced, unsurpassed in efficiency, lightweight models. Miniature batteries and tubes. Credit plan available. Free literature. Dept. 558.

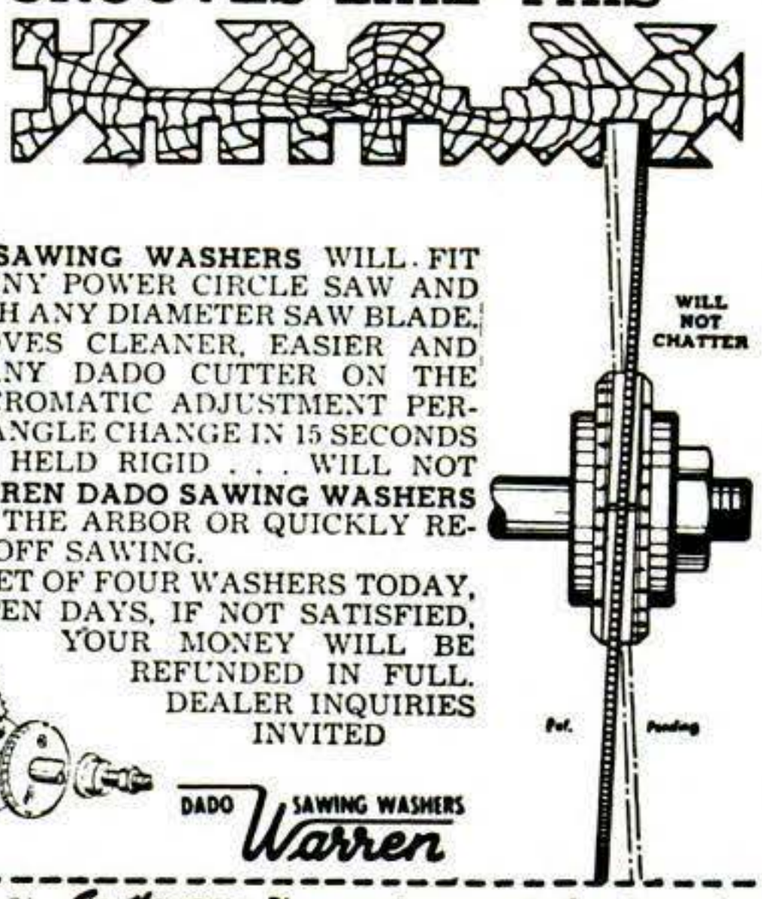
FISHER RESEARCH LABORATORY Inc.,
Palo Alto, Calif.

Woodworkers!!

Make your circular saw the most versatile tool you own!

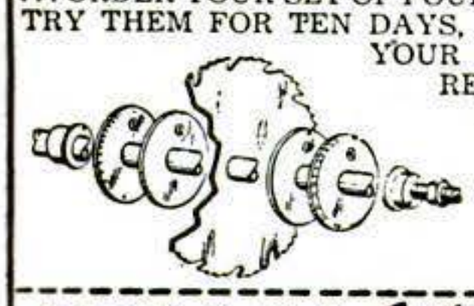
CUT GROOVES LIKE THIS

$4.95 SET
POSTPAID INCLUDING TAX



WARREN DADO SAWING WASHERS WILL FIT THE ARBOR OF ANY POWER CIRCLE SAW AND CAN BE USED WITH ANY DIAMETER SAW BLADE. . . . CUTS GROOVES CLEANER, EASIER AND FASTER THAN ANY DADO CUTTER ON THE MARKET . . . MICROMATIC ADJUSTMENT PERMITS A CUTTING ANGLE CHANGE IN 15 SECONDS . . . SAW BLADE HELD RIGID . . . WILL NOT CHATTER . . . **WARREN DADO SAWING WASHERS** CAN BE LEFT ON THE ARBOR OR QUICKLY REMOVED FOR CUT OFF SAWING.

. . . ORDER YOUR SET OF FOUR WASHERS TODAY, TRY THEM FOR TEN DAYS, IF NOT SATISFIED, YOUR MONEY WILL BE REFUNDED IN FULL. DEALER INQUIRIES INVITED



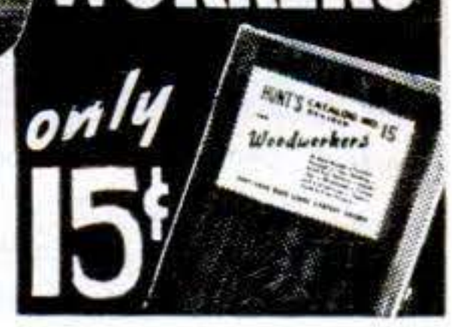
DADO SAWING WASHERS *Warren*

Arbor ☐ ½ ☐ ¾
Sizes ☐ ⅝ ☐ 1
☐ Free Circular
☐ Check
☐ Money Order

Gentlemen:- Please send _____ sets of sawing washers:
Name ..... PLEASE PRINT
Address .....
City ..... State .....
ALL SETS SHIPPED POSTPAID

WARREN DADO SAWING WASHERS CO.
P. O. BOX 98 NORTH END STATION
DETROIT, MICHIGAN

WOOD WORKERS



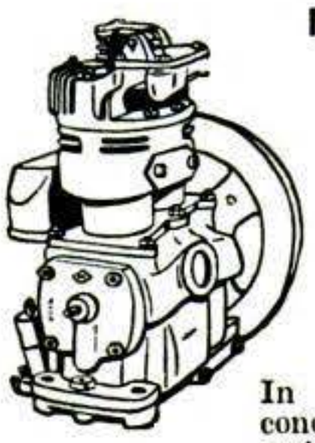
Lumber—Plywood Available

Harold Hunt wants to send you big new No. 15-A Catalog. Over 148 pages of woodworking ideas. 12 pages of rare woods in colors. UNEQUALED BARGAINS in imported and American woods, supplies, hard-to-find hardware. Send only 15c to cover postage and handling.

CRAFTSMAN WOOD SERVICE CO.
2729 S. Mary St. Dept. B-94 Chicago 8, Ill.

only **15¢**

AIR COMPRESSORS



Model 2-U-S-4-V-A Bendix-Westinghouse 4 cu. ft.

Govt. Surplus, 2 cylinder Bus and Truck Type. Ball bearing crank shaft. Pressure feed oil system. Positively one of the finest and most accurately built air compressors on the market.

Original Cost Over $140.00

In good operating condition with 30 day written guarantee **$34.50** Special Low "as is" price **$29.50**

Accessories available for compressors, air regulators, safety valves, air gauges, control governor, misc. fittings, hose, paint guns. Write for Prices and Catalogue.

MIDWEST SURPLUS SALES CO. 2531 Indiana Kansas City, Mo.

Copyrighted material

U. S. NAVY 7x50

PRISM
BINOCULARS
with Coated Optics

Used but in EXCELLENT CONDITION

$95.00

Complete with leather carrying case and sling

Universal, 6 x 30 Navy Prism Binoculars, used but in excellent condition, complete with leather case and sling straps **$42.50**
With Coated Optics, $10 Extra.

Field Glass, 4 x 40 Wollensak. Ideal for bird study. **Brand New**. **$17.95**

New U. S. Government Surplus
TRIPODS

Purchased by Government for engineers levels and transits. Adjustable to any height. Threaded head for levels or transits. Value $75. **SPECIAL** **$13.50**

WHEATSTONE BRIDGES

Portable. Used, in excellent condition. Manufactured by Thompson Lever Mfg. Co., Philadelphia. Value $150.00. **Special** **$94.50**

Engineers All Metal Army Type Hand-Sighting
LEVELS

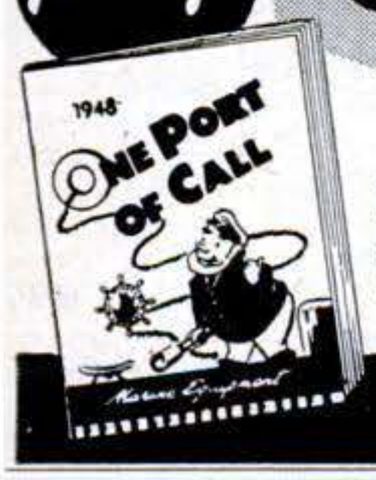
$2.00 *PRECISION QUALITY*

Send 25c for catalog of new and used guns, ammunition, binoculars and powder flasks.

PUBLIC SPORT SHOPS
11 S. 16th St., Phila. 2, Pa. **No COD's**

NEW!

112 PG. MARINE EQUIPMENT CATALOG



for BOAT OWNERS, BOAT ASSEMBLERS, HOME CRAFTSMEN

A handy, valuable guide for boat kit assemblers and boat owners. Completely illustrated. Reserve your catalog now. Send only 25c to help cover costs.

OLUF MIKKELSEN COMPANY
393 Fourth Avenue, New York 16, N. Y.

A YEAR 'ROUND *Labor Saver*

CHOREMASTER

for

CULTIVATING
PLOWING
GRASS CUTTING
WEED CUTTING
SNOW PLOWING

and dozens of other uses . . .

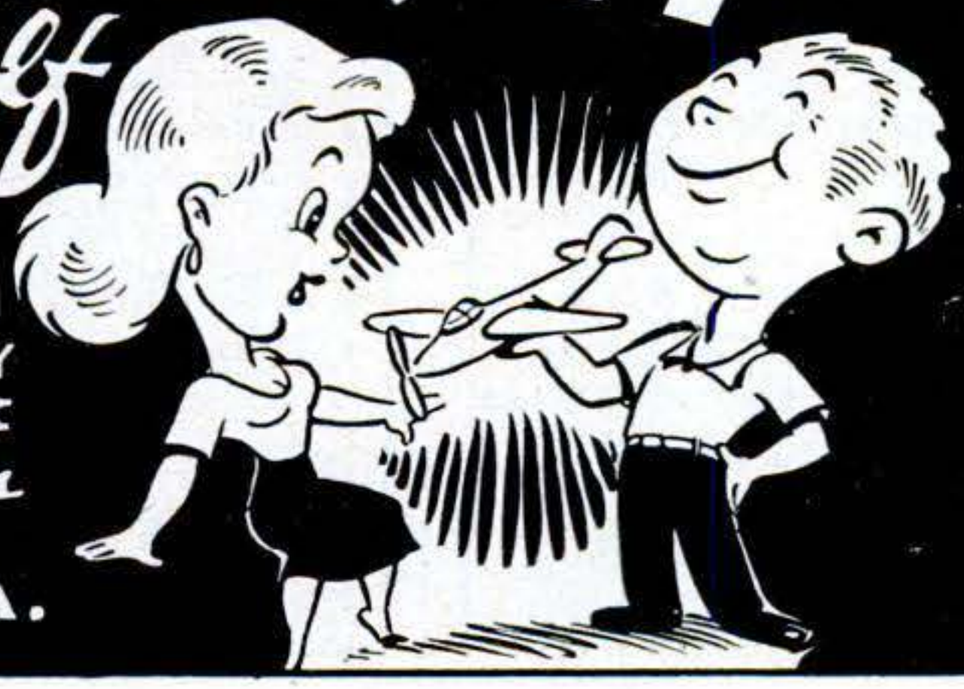
$146.50 std. clutch
$157.00 with mercury clutch
PLUS FREIGHT

Do your gardening, grass cutting, cultivating or snow plowing, yet add to your leisure and comfort. Save hours and aches with the New CHOREMASTER on your garden, lawn, farm or suburban estate. This rugged tractor zips through tasks formerly taking hours of backbreaking labor. The finest value money can buy. Send for attractive folder showing attachments, applications, and nearest dealer's name.

CHOREMASTER

Made by Special Products Division
The LODGE & SHIPLEY *Co.*
816-6 Evans St. Cincinnati 4, Ohio

PLASTIK-IT *yourself*



EVERYTHING YOU NEED TO CAST ANY OBJECT IN PLASTIC
Loads Of Fun
FOR ONLY $1.00 P.P. U.S.A.

It's SIMPLE PRACTICAL AND FUN

JUST PRESS OBJECT IN MOULDING MATERIAL— POUR IN PLASTIC- CURE IN KITCHEN OVEN.

KIT INCLUDES PLASTICS
LIQUID CATYLIST
MOULDING MATERIAL-
INSTRUCTIONS ETC.

SEND ONE DOLLAR TO

MIAMI *AEROMARINE*, INC.
238 BISCAYNE BLVD.
MIAMI, FLA.

Copyrighted material

Free! New CONCORD RADIO Catalog

The ONLY Complete Up-to-the-minute Catalog of
RADIO PARTS • RADIO SETS
KITS • HAM GEAR • TESTERS

The greatest, latest complete presentation of radio, electronic and television equipment and supplies in Concord history! Packed from cover to cover with thousands of items—160 pages of everything in Radio and Electronics. Special bargain section of hundreds of money-saving values. Scores of new items from famous makers. Parts, blueprints for famous Popular Mechanics and many other kits. Write for FREE copy. Please address department 116.

CONCORD RADIO CORP.

CHICAGO 7 — 901 W. Jackson Blvd.
ATLANTA 3 — 265 Peachtree Street
Downtown Chicago Branch: 229 W. Madison
LAFAYETTE RADIO CORPORATION

ALL-PURPOSE SPRAY GUN

For FLOCKING or SANDBLASTING
Uses only 25 lbs. air pressure

The Blasto Spray Gun for either flocking or sandblasting. Operates off small air compressors, using only 25 to 30 pounds of air pressure. Over 101 uses around the home, shop, garage. A syphon-type gun. Uses standard mason jars for easy, simple replacement when changing colors and convenient for storage. An ideal spray gun for spraying smooth, velvet finish surfaces, sandblasting glass, cars, tools, wood designs. Made of Aluminum Alloy Casting, brass fittings, chrom molybdenum heat treated nozzle and air jet. Only **$16.95** complete with flock and ready to use. 5-Day Money Back Guarantee. Cash, or money orders postpaid in U.S.A. California orders add 2½% Sales Tax. Or write for free information.

Only $16.95 complete

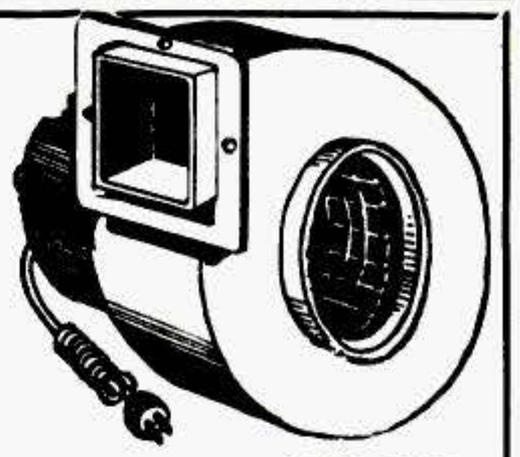
BLASTO SPRAY GUN MFG.
Dept. PS-6, 7007 Haas Ave., Los Angeles 44, Cal.

THE GIFT FOR DAD
that Keeps on Giving
HULL AUTOMOBILE COMPASS

Makes knowing the way sure, safe and easy. **Beaconlite** illuminated, **$5.95; Streamline** standard, **$3.95.** At your dealer's. Write for circular.

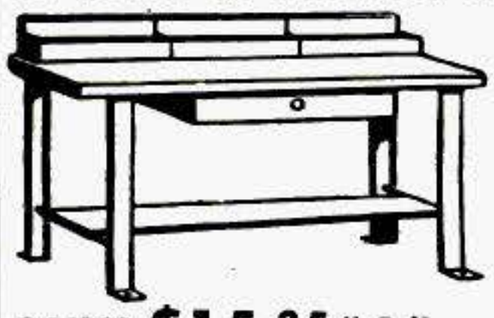
HULL MFG. CO., P. O. Box 246-E7, Warren, Ohio

Heavy Cast Aluminum Blower Now Only $10.00



SINGLE EXHAUST BLOWER DELIVERS 100 CU. FT. AIR PER MINUTE. Ready to install yourself with any household tools. It's built for that. Housing is solid cast aluminum to last indefinitely. 110 V., A.C., 50-60 cycles. Cont. duty motor.

DOUBLE EXHAUST BLOWER
***Only* $15.85**
On Blowers, add 50c for handling: $1 west of Mississippi.



WORK BENCH WITH ALL WELDED STEEL LEGS

ONLY $15.35 F.O.B. Yonkers or send $5 & bal. C.O.D.

Ideal for Mechanics, Hobby Shops, Craftsmen

A super value! Legs are welded steel. Top is 2" solid plank stock. Bottom shelf is 1" pine. Large, roomy tool rack and bins for nails, nuts, bolts are pine. 32" high, 60" long x 23" wide with lower shelf and big drawer. Wt. approx. 100 lbs. . . . **Shipped KD with bolts, nuts, screws for easy assembly.**

ALL PRODUCTS CARRY MONEY-BACK GUARANTEE!
Send check, money order. Free literature.

UNIVERSAL YONKERS CORP., (S-6) 137 Alexander St., Yonkers 2, N. Y.

CENTER DRILL HOLDER

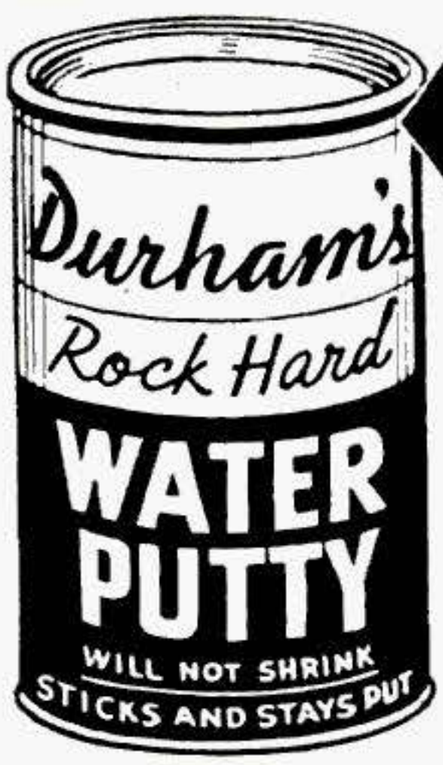
Rigid and accurate. Holds combination center drill and countersink in tailstock or headstock spindle of lathe. Made of steel. Shank precision ground.

Taper Shank	Drill Dia.	Price
No. 2 M T	13/64"	$2.50
2	3/10	2.50
2	7/16	2.50
3	13/64	3.25
3	3/10	3.25
3	7/16	3.25

See your dealer—or sent direct postpaid.

SOUTH BEND LATHE WORKS
456A East Madison Street
South Bend 22, Indiana

SOUTH BEND



The Modern PLASTIC for lasting Home Repairs

PERMANENTLY mends cracks or holes in wood, tile, stone or plaster. Sticks and stays put—Does not chip, shrink or fall out. Easy to use. Economical. Mold it, chisel it, polish or paint it. If unobtainable from your lumber, paint or hardware dealer, the big 4-lb. can will be sent you postpaid (in U.S.) for only $1. Full money-back guarantee, order now.

DONALD DURHAM CO.
Box 804-R, Des Moines, Iowa

¼-TON ARBOR PRESS

Ideal for straightening, bending, light stamping, riveting, staking, production assembly and general presswork. Used ten years in plants and shops—bushings, cameras, reels, typewriters, instruments, light molding, etc. Grey iron castings. Height 7½"; over table 2½"; over base 4¾"; ram 5/16" x 7/16"; ram travel 2¼"; approx. pressure 500 lb. Weight 7 lb.

$9.50 POSTPAID U.S.A., MONEY-BACK GUARANTEE.

H. D. HERDER, Tool Specialties
2426 Brook Dr. KALAMAZOO 82, MICH.

"LATHE TOOL HOLDER IS AMAZING!"

says Howard Ladue of Royal Oak, Mich. "I can grind tool bits! Turn large discs! Hold dial indicator! Dress grinding wheels and do many other things with the Porter Holder on my Atlas 10" lathe. It's a whiz!" Fits all 1" tool posts. See your dealer or order direct. **$2.65** postpaid. Money back guarantee.

HURON FACTORY SERVICE CO.
505 Lafayette Bldg., Dept. 8, Detroit 26, Mich.

Say You Saw It In Popular Science

SUPER-MITE RADIO

STANDARD BROADCAST • NEW 1948 MODEL • SHORT WAVE

PACKS AMAZING POWER!

$5.99

SUPER-MITE FEATURES

- **World's most powerful midget radio**
- **Uses war-born midget electronic tubes**
- **Over 2,000 mile broadcast range**
- **Overseas short-wave reception**
- **Powered by pen-cells or midget battery**
- **Portable, for campers, hikers, etc.**
- **Picture diagram for radio beginners**
- **No experience needed to wire set**

New Custom-Engineered 1948 Model has veriable tuning and patented adjustable short-wave coil. Brilliant red chassis, silver and black dial, streamlined control knobs. Complete set ready to wire $5.99 Post Paid. Tubes 95c each.

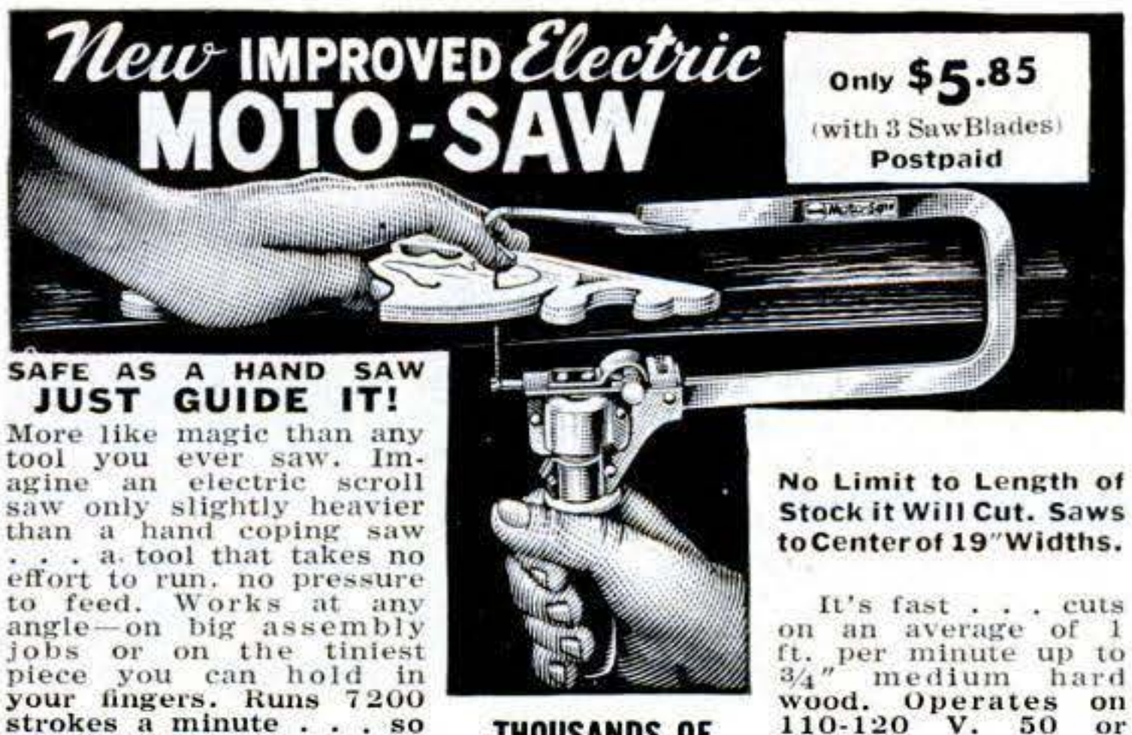
SUPER-MITE JR. POWERFUL 1948 MODEL $3.99

Miracle War-Born midget tube gives this tiny one tube set over 1,000 mile broadcast range. Brilliant red crackle finished chassis, special tuning coil and powered by pen-cells or midget battery. Complete set with beginners picture diagram Only $3.99 Post Paid. Special electronic tube 95c

Electronic Research, 1216 Park Row Bldg., New York City 7

New IMPROVED *Electric* MOTO-SAW

Only $5.85 (with 3 Saw Blades) Postpaid



SAFE AS A HAND SAW
JUST GUIDE IT!

More like magic than any tool you ever saw. Imagine an electric scroll saw only slightly heavier than a hand coping saw . . . a tool that takes no effort to run, no pressure to feed. Works at any angle—on big assembly jobs or on the tiniest piece you can hold in your fingers. Runs 7200 strokes a minute . . . so fast the blade seems to stand still. Sturdily built . . . only two moving parts . . . never needs oiling. Easily cuts intricate designs—so smooth it eliminates sanding. Novice or craftsman, a thrill awaits you when you get a Moto-Saw in your hand.

THOUSANDS OF SATISFIED USERS

U.S. Patent 2233862
Other Patents Pend.

DREMEL MFG. CO.
Dept. S-128-F
Racine, Wisconsin

No Limit to Length of Stock it Will Cut. Saws to Center of 19" Widths.

It's fast . . . cuts on an average of 1 ft. per minute up to 3/4" medium hard wood. Operates on 110-120 V. 50 or 60 cycle alternating current. If your dealer does not yet have Moto-Saw, send **$5.85** . . . we'll pay postage. Or send **$1**, pay postman balance plus postage. MONEY BACK if not delighted after 5 days' trial.

ONE-MAN SAWMILL LESS THAN $200.00

Easy To Turn Trees Into Money

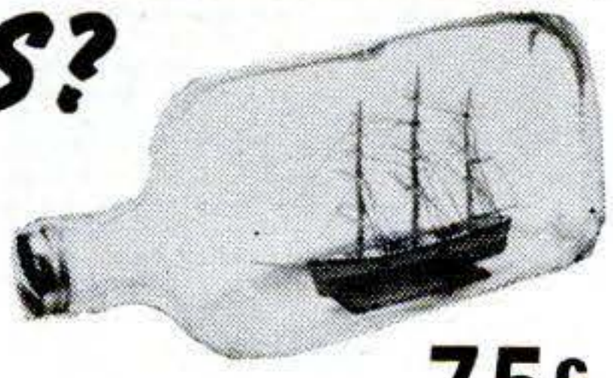
Makes Lumber ties, shingles, crates, lath, studding.

BELSAW MODELS in 10 to 24 foot sawing lengths. **MECHANICAL FEED,** accurate set works and positive dogs. Use tractor or old auto engine for low cost power. Thousands used for commercial sawing. Pays for itself quickly. Send post card today for FREE booklet, "How To Make Lumber" and Catalog of Woodworking Equipment.

BELSAW MACHINERY COMPANY
2846-Q Field Bldg., 315 Westport Rd., Kansas City 2, Mo.

CURIOUS?

ABOUT A
SHIP-IN-A-BOTTLE
HERE IS THE SECRET

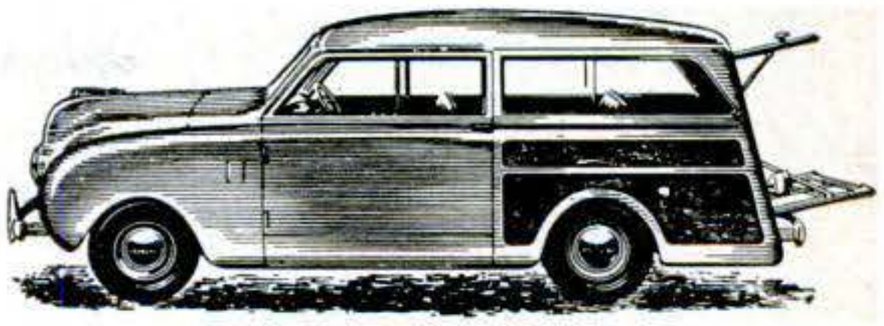


PLUS all of the material for only 75c postpaid, less bottle.—For other unusual and beautiful projects send 10c for the new, fully illustrated catalog.

75c Postpaid in U.S.A.

Braun-Craft 1232 ETOWAH, DEPT. PS-6
ROYAL OAK, MICHIGAN

NEW CROSLEY STATION WAGON



Smart styling. All steel. Seats 4, or 2 with 1/4 ton load. Priced $600 to $700 less than any other station wagon, costs about 1/2 as much to run. Typical owner's report:

Sylvia P. Walker, 56 Forest Ave., Orono, Maine, drove her Crosley 7,790 miles, averaged 35 to 42 miles per gallon. Total cost, $50.00.

Convertible: If you love sun and air.

Panel Delivery: Full 1/4 ton capacity.

Sedan: Over 20,000 now on the road.

Pickup: Cuts service and delivery costs.

Sports-Utility: Rear seat obtainable. Lowest priced Crosley—$130 less than station wagon.

CROSLEY
a FINE car

For beautiful full-color catalog, write: Crosley Motors, Inc., 2532-JN Spring Grove Ave., Cincinnati 14, Ohio

NEW! *TRUE TEMPER* "CRIPPLED SHAD"

5/8 oz.
6 best finishes

$1.25
AT YOUR DEALER'S

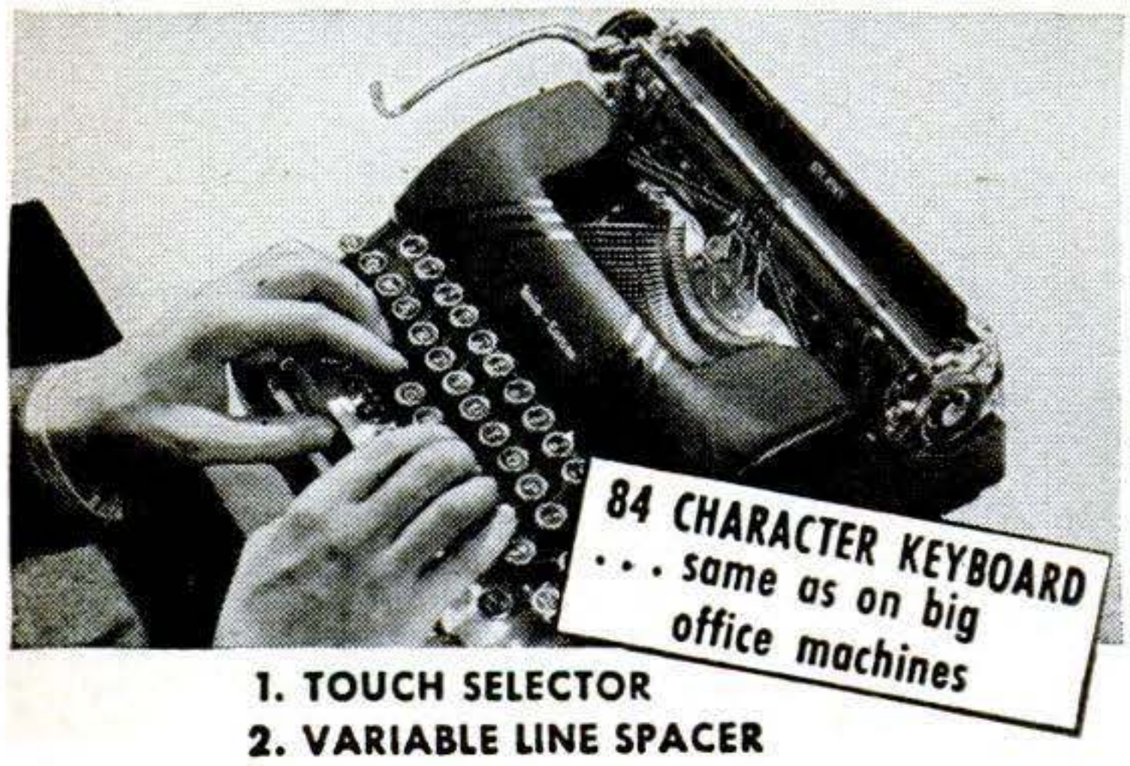
★ A floater
★ Improves on nature
★ Wounded minnow action
★ Each, factory tested to insure perfect action

CAN YOU TOP THIS?
"I'm going to Alaska next month. Tackle must be trimmed to the **MOST ESSENTIAL** items. A supply of your Crippled Shad Minnows are sure going to be included in my kit." Dick Wood, North Chattanooga, Tenn. If you have a better story on necessity for Crippled Shad, we'll print it—with permission. The American Fork and Hoe Company, Cleveland, Ohio. Write: Sporting Goods Division, Box 4-E, Geneva, Ohio.

Produced and recommended by the Makers of *TRUE TEMPER*, Rod of Champions.

Copyrighted material

5 BIG TYPING FEATURES with a Smith-Corona PORTABLE TYPEWRITER



1. TOUCH SELECTOR
2. VARIABLE LINE SPACER
3. FLOATING SHIFT
4. ONE STROKE RIBBON REVERSE
5. TYPEBAR SPEED BOOSTER

ASK DEALER FOR DEMONSTRATION

Smith-Corona
PORTABLE TYPEWRITER

Working with a powerful Dumore is faster, easier — twice the fun!

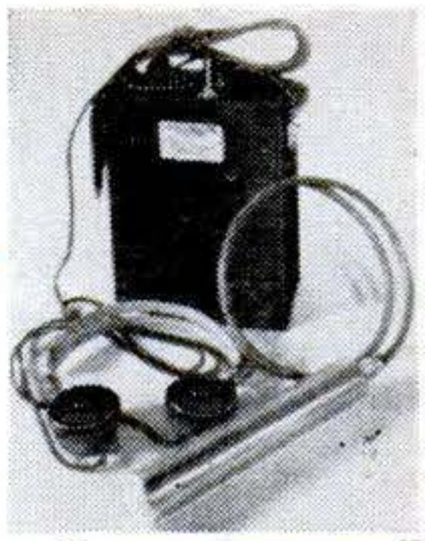
—extra power, capacity, and flexibility for jobs in plastics, wood, and metal

A Dumore Duplex gives you: a full 1/14 HP motor for heavy jobs; extra-capacity chuck for 1/4", 1/8", 3/32" tool sizes; attachments to convert for bench, lathe, and flexible-shaft duty. See it at your dealers, or write for details today! The Dumore Co., Dept. F-52, Racine, Wis.

Tear out this coupon and mail today!

The Dumore Co., Dept. F-52, Racine, Wis.
check
☐ Please send me complete information on the Duplex Grinder.
☐ Send me Deluxe Duplex Kit (27 accessories), $27.50 enclosed.
☐ Send me Standard Duplex Kit (9 accessories), $19.75 enclosed.
Shipping charges C.O.D.
Name.....
Address.....
City.....(.....) State... ...
H-14A

TX-5 GEIGER COUNTER *for Locating* RADIOACTIVE MINERALS



The TX-5 is light weight, battery operated. Locates deposits of radioactives. Simply switch "on" — clicks in headphones indicate presence of radioactives. Extra sensitive, yet ruggedly built.

Each unit comes complete with headphones, probe, batteries and manual. For prospecting and mining operations. Write for details and price. Address Dept. 2

Geiger Counters for every purpose..
- OIL PROSPECTING
- MINERAL LOCATION
- HOSPITAL WORK
- INDUSTRIAL USE

OMAHA SCIENTIFIC SUPPLY CORP., 3623 LAKE, OMAHA 4, NEBR.

ELECTRIC WELDER

AC or DC 110 Volts

Pre-war type—All metal—No chemical—5 year written guarantee. Welds 1/8" thick metal or money back. Repairs tanks, tools, **fenders, machine parts, etc. Comes complete with rods, unit directions and eye shield. On C.O.D. mailing charges extra.**

$6.45 Complete

ESSAY MFG. CO., INC.
Dept. P.S. **Quincy 69, Mass.**

WOODWORKERS . . . *Get this*

CONSTANTINE MASTER MANUAL

Get the Most Fun From Your Hobby

Indispensable to woodworkers. Newest, biggest edition, more pages, more color, helpful how-to-do-it articles, pre-war and new items, more bargains. Send 25c today and we will include *FREE! FULL YRS. SUBSCRIPTION* to Chips and Chats, published bi-monthly. Keeps you up-to-date on everything in woodworking, offers big money-saving bargains. Send now.

ALBERT CONSTANTINE & SON. Inc.
793-B 135th Street, New York 54, N. Y.

CANVAS COVERS **Waterproof tarpaulins,** war surplus (Used), perfect condition. Originally made for tents. Approx. 5'x8'. Two buttoned together make approx. 80 sq. ft. Complete with buttons attached. Suitable for use as canvas dams, hay covers, truck covers, machinery and equipment covers, etc. Packed in bales 40 each, priced 40 covers, **$1.00** ea; 15 covers, **$1.50** ea. Less than 15, **$1.75** ea. All FOB, Kansas City.

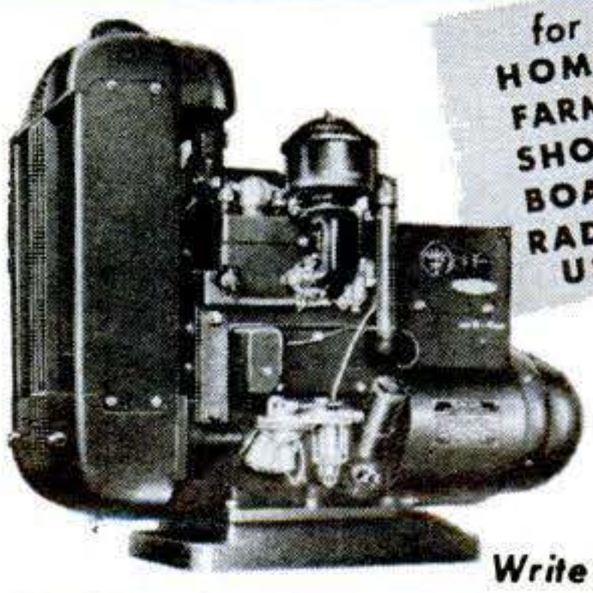
AMERICAN SUPPLY CO.
329 W. 5th **Dept. P. S.** **Kansas City, Mo.**

FIREARMS and SWORDS

You don't want to miss our new thrill-packed catalog. Fascinating background and illustrations of 3300 authentic pieces. Exceptional values in hard-to-find items. For your 180 page catalog, simply send 50c to cover postage and handling, with your name and address, to

ROBERT ABELS, Box PS, 860 Lexington Avenue, New York 21, N. Y.

ELECTRICITY *Anywhere*



for HOMES FARMS SHOPS BOATS RADIO USE

● Onan gasoline-engine-driven Electric Plants supply reliable, economical electric service for any use Portable, stationary or stand-by models. Water or air-cooled, compact and rugged.

A.C.: 350 to 35,000 watts in all standard voltages and frequencies. D.C.: 600 to 10,000 watts, 115 and 230 volts. BATTERY CHARGERS: 500 to 3,500 watts; 6, 12, 24, 32 volts.

Write for folder

D. W. ONAN & SONS INC.
2786 Royalston Ave., Minneapolis 5, Minn.

Onan PRODUCTS

Copyrighted material

PERFECT FATHER'S DAY GIFT

for Perfect

SHAVING EVERY DAY!

With Stan-lite illuminated Mirror

• Shaving becomes fun instead of work with this amazing all-purpose illuminated mirror! Bulb brightens up your face INSTANTLY. Shave is closer. Reversible 5½" mirror has regular face one side, magnifying on other. Made of rich, gleaming brass that keeps its lustre. Utility box (4"x6"x2") holds shaving articles, etc. Complete with 6 ft. cord, on-off-control switch on cord and plug-in-socket on back.

Operates AC or DC.

SEND NO MONEY

MAIL ORDERS FILLED

Just pay postman $7.95 plus pstg. or enclose money & we'll pay pstg.

Money-Back Guarantee!

STANFORD MIRROR and METAL PRODUCTS CO.

22 Howard St., (Dept. 226), New York 13, New York

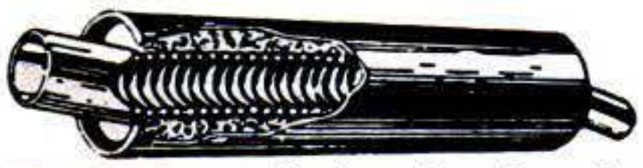
PROTECTO Grips *Stay Put*

For safety, comfort, and insulation, equip your pliers with a pair of these tough, rugged plastic grips. Their ribbed surface gives surer, no-slip grip. Easy to apply—and they stay put. 75c a pair (60c in doz. lots) at hardware and electrical stores. Write for dealer's name.

COMFORT PROTECTION

BUCKINGHAM MFG. CO., Inc.
Bevier & Travis Sts. Binghamton, N. Y.

DOUGLASS Steel-Pack MUFFLERS



For All Makes and Models

The Choice of Those Who Know
•
Deep Throbbing Tone

Engineered and produced by experienced craftsmen. Rugged construction. Steel tubing. (No aluminum). Straight-thru design. Solid tube with steel packing.

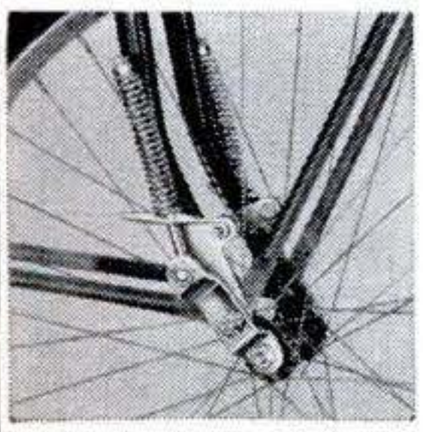
Get increased speed, more power and improved economy. Your friends will envy that "throbbing deep tone" which increases with speed.

Complete ready for easy installation. Set of matched tone duals for Ford and Mercury, '35-'48 $20. Singles from $4.95. Send for price list. Chrome tail pipes, $1.75. Order direct. Specify year and model. Sent F.O.B. factory. Check, money order or C.O.D. Satisfaction guaranteed.

RACING EQUIPMENT CO. Dept. DS-1

1916 W. Valley **Alhambra, Calif.**

Do You Ride a Bike? Here's the Real



SHOCKMASTER

for all Bicycles

- **LEVELS ROUGH ROADS**
- **PREVENTS BROKEN SPOKES, WHEELS, FORKS**
- **MAKES RIDING SMOOTHER, SAFER**
- **EASY TO INSTALL**

A Shockmaster and front wheel shock absorber ruggedly constructed of nickel plated steel and engineered for years of real service. It'll pay for itself in added pleasure. saves tires and eliminates many costly repair bills. 20.000 satisfied users. Order yours today. Only $3.69 postpaid. No C.O.D.'s. Complete satisfaction or money back. Dealers Wanted.

H. M. GIBB and COMPANY

1304 PENOBSCOT BLDG. DEPT. B DETROIT 26, MICH.

INSTANTLY CONVERTS LINEAR FEET TO BOARD FEET

Solves many other woodworking problems in seconds

only 10¢

Easy to use. Fast . . . simply set dial of GREENLEE Handy Calculator to get measurements; slope per foot in degrees; comparative hardness, weights and workability of various woods; bit sizes; nail specifications; tool sharpening hints. 6" diameter heavy varnished cardboard. Special offer by maker of famous GREENLEE tools. Send 10¢ to Greenlee Tool Co., 2126 Columbia Avenue, Rockford, Illinois.

TOOLS FOR CRAFTSMEN

GREENLEE

Copyrighted material

NEW POWERFUL
(PENCIL TYPE) MICROSCOPE

Fits the Pocket like a Pencil!

for: PROFESSIONALS AMATEURS—STUDENTS

The EDERSCOPE offers distinct advantages over many magnifiers because of its adaptability, instantly, for the purpose. No tripod or other support required. Finest adjustment for proper focusing. Precision and polished optical lenses of the finest quality. Excellent in GEOLOGY, CHEMISTRY, CHRYSTALLOGY, ZOOLOGY, ENTOMOLOGY, BIOLOGY, DERMATOLOGY, BOTANY, METALLURGY, etc. Also for Printing & Engraving, Stamps & Coins, Gem-Polishing, Textiles, Paper Products, Tools & Dies, Inspection & many others. POSITIVELY HIGHEST QUALITY GUARANTEED!

EASILY AND QUICKLY FOCUSED

Common Salt Magnified

MORE THAN **25 Power** Magnification

SHARP DEFINITION

NO DISTORTION

LONG WORKING DISTANCE advantage over magnifiers and loupes.

ONLY **$10.00**

Postage Paid
SEND NO MONEY

Pay postman on delivery only $10 plus C.O.D. postage, or send $10 with order and we pay postage. GENUINE LEATHER CASE FREE.

Order Yours Today

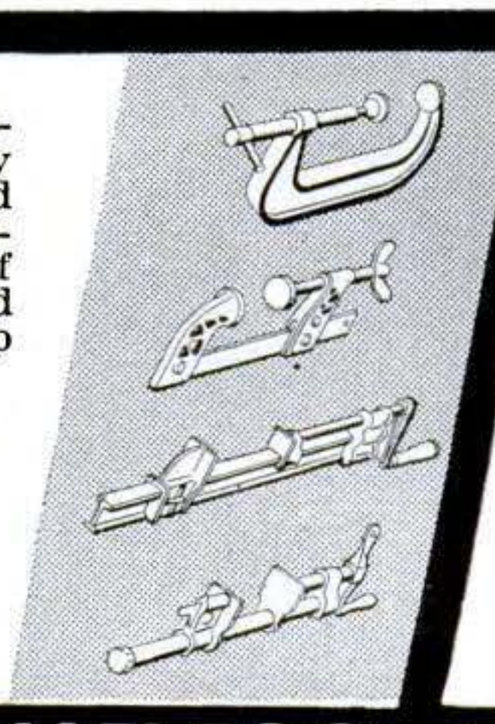
Dealers Invited

Streamline Design 5 inches long

EDER INSTRUMENT CO.
Manufacturers & Developers of Optical Instruments
1849 No. Halsted St., CHICAGO 14, ILL.

HARGRAVE

No. 600
CLAMP FIXTURE



Fits ¾" pipe, can be applied to any length. Easy to assemble. Hardened steel cam holds tight, releases easily. Made of best malleable. Also wood bar and ½" pipe clamp fixtures available.

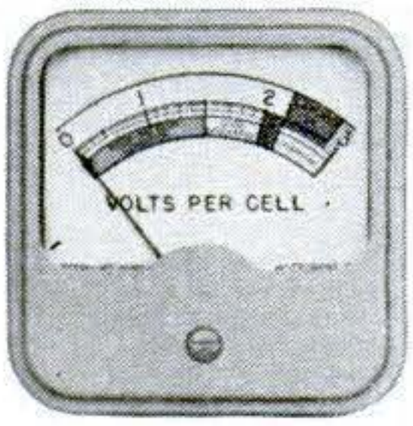
At Hardware and Mill Supply Dealers Everywhere.

Write for Catalog of Complete Line

1955 Waverly Ave.
Cincinnati 12, Ohio

The **CINCINNATI TOOL** *Co.*

CAR BATTERY TESTER



Checks voltage of individual storage battery cells under operating conditions. Red, yellow, and green areas indicate satisfactory or unsatisfactory operation while under load, no load, or charging. Calibrated scale 0-3 volts. Will check flashlite or #6 dry cells. 2¾" square.
Stock No. MVD-25..... **$2.00** post-paid

DUBIN ELECTRONICS CO., Inc.
Dept. PS-6, Box 68, Corona, New York

BUILD YOUR OWN FAST FREEZER

PLANS $1

It's easy to build this household appliance with LeJay Plans. Made from new or used parts. Save up to 75%. No expert knowledge needed. Plans show 5 sizes and are easy to follow. All details clearly explained. Enjoy making one of these freezers. Mail $1 for set of plans and catalog. **LEJAY MFG. CO., 423 LeJay Bldg., Minneapolis 8, Minnesota**

5 sizes 8 to 40 cu.ft.

AGENTS 300% Profit

SIGN LETTERS

For Store Fronts and Office Windows. Anyone can put them on. Free Samples. Liberal Offer to general agents.
METALLIC LETTER CO., 441 N. Clark, Chicago 10

RUBBER TIRED STEEL WHEELS

$2.25 per pkg.

4 heavy-duty, spot-welded 7½" wheels, 2 axles. Painted red, postpaid anywhere, cash with order. Refund if not satisfied. Discount in quantity.

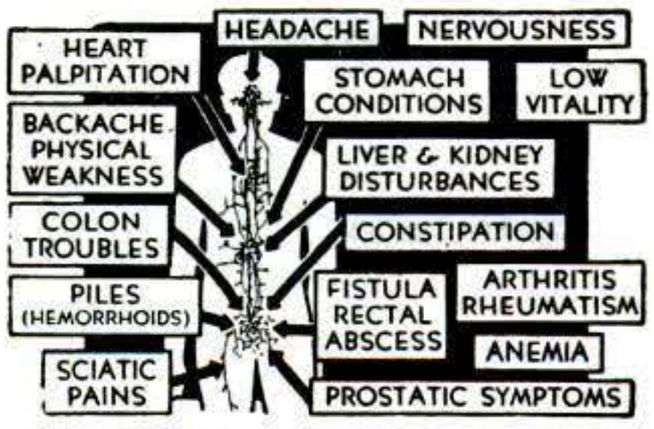
STEEL CO. OF OHIO 5 E. LONG STREET COLUMBUS 15, OHIO

OTTAWA "YARD-MASTER"

Most useful machine of its kind. Powerful 2-HP motor. It mows grass or weeds, tills soil and cultivates (see picture), moves snow, pumps water, runs a grinder, etc. **TWO SPEEDS** and Free Wheeling. Nothing else like it. "YARD-MASTER" is much needed year 'round machine. Mows close to trees and under fences. Follows ground contour. One man mows 3 to 6 acres a day. Boy or woman operates easily. Designed for private homes, estate, etc. Sold direct to user. Free details with low prices.
OTTAWA MFG. CO., 3-801 Lawn Ave., Ottawa, Kansas

Piles May Lead to Chronic Ailments

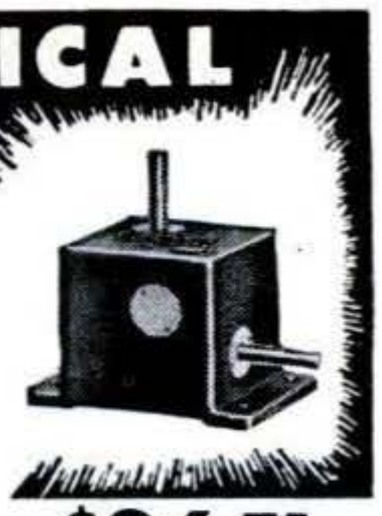
FREE BOOK — Explains the Causes and Effects



No obligation. Write to Thornton & Minor Clinic, Suite 649, 926 McGee St., Kansas City, Mo.

Copyrighted material

SMALL VERTICAL SPEED REDUCER

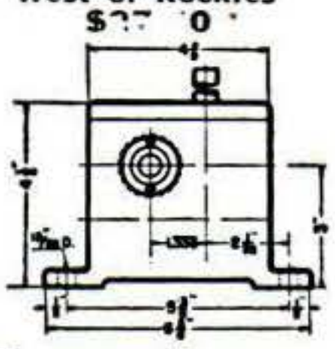


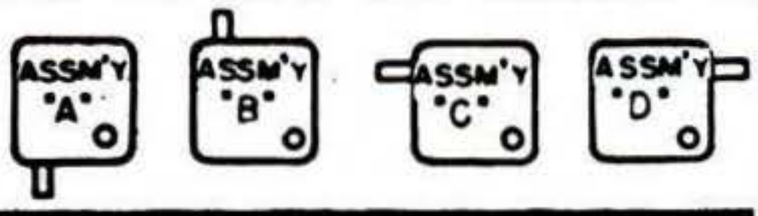
Just the thing for Home and Shop Bench work, Animated and Revolving Displays, Revolving Antennae, Light Production work. Sturdy, compact, (see dimensions), efficient. Case of aluminum, gears of specially selected nickel bronze; worm of hardened steel. Roller bearings throughout. Torque capacity, 25 to 150 inch lbs. Available in 4 different assemblies (see below) and in these standard ratios:

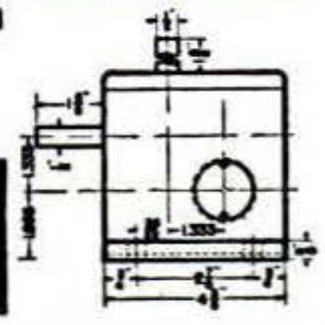
$26.75
West of Rockies
$27.[illegible]0

4-1	25-1	64-1	200-1
8-1	30-1	75-1	300-1
10-1	40-1	80-1	400-1
16-1	50-1	100-1	600-1
20-1	60-1	150-1	800-1
		1600-1	

When ordering be sure to specify assembly and ratio required. Shipping weight in carton 8½ lbs. Prompt delivery. Full Money Back Guarantee.







THE OHIO GEAR CO.
1426 EAST 179th ST. • CLEVELAND 10, OHIO

BUILD YOUR OWN POWER TOOLS

BALL BEARING ARBORS $7.95

Rugged aluminum alloy housing, precision machined steel shaft, heavy duty ball bearings, sealed and greased for life, shaft threaded for ½", ⅝" or ¾" hole, state size wanted.

2 SIZES
2¼x9" housing—13½" overall **$7.95**
2¼"x13" housing—18" overall **$8.95**
Shipped immediately Post Paid

Designed and manufactured exclusively by us, built to take it, with reliable guarantee.

We also manufacture 8" sanding discs and rubber-faced aluminum pulleys for 6" belt sanders

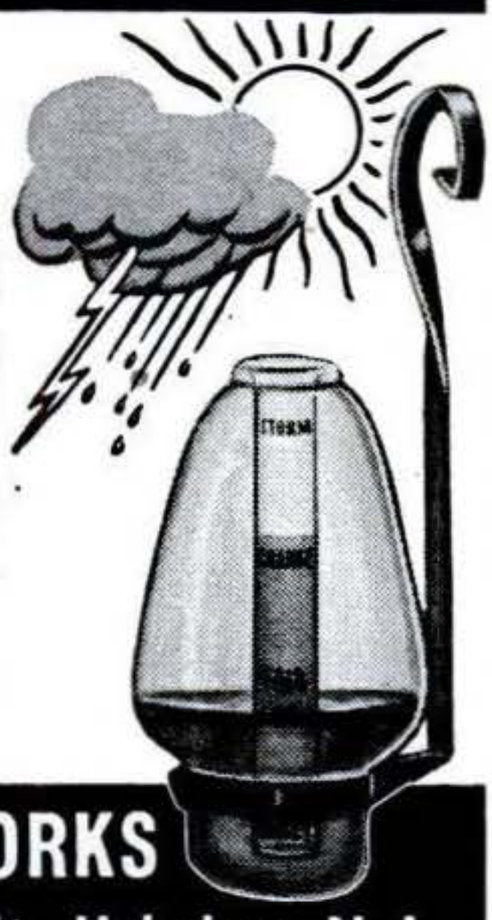
O. V. HAWTHORNE TOOL CO. OTSEGO 1, MICH.

Print Your Own

Cards, stationery, circulars, tags, labels, photo and movie titles, advertising, etc. Save money. **Print for Others, Good Profit;** easy rules sent. Raised Printing like Engraving, too. Send dime for press samples, supply book, all details and advice on your needs. No obligation. **KELSEY INC., B-33, Meriden, Conn.**

The Original NIGHTINGALE SCIENTIFIC BAROMETER

Forecasts the weather Instantly 8 to 24 hours in advance



At last an accurate barometer at a cost within the reach of everyone. Actually more accurate than dial barometers costing ten times as much. Beautifully designed and made of antiqued metal with graceful crystal clear bulb to beautify any room.

Complete, ready for instant use plus interesting, historical "Story of the Barometer." Truly a "once-in-a-lifetime" value.

Send only $1.25, we pay postage. Add postage on C.O.D. orders. Your money back if not satisfied.

ELRAM LAMP WORKS
Dept. P2 220 Adams St., Hoboken, N. J.

New Way to Own AN AMAZING New Hearing Aid!

- *Comes to you by mail*
- *Satisfaction Guaranteed Or Your Money Back*
- *Just Clip Coupon Below*

So good we can offer you this
MONEY-BACK TRIAL!

Wear the Zenith "75" at home, at work, anywhere. If it isn't better than you ever dreamed ANY hearing aid could be, return it within 10 days of receipt and Zenith will refund your money in full.

Saves you over $100, too! Because the new Zenith "75" needs no "fitting," it saves you embarrassing visits to salesrooms and annoying sales pressure. Also, it saves you over $100 cash money. If its price had to include conventional selling costs and profits, this top quality hearing aid would have to sell for $195 instead of $75! So do as tens of thousands have already done. Find new happiness and success by mailing the coupon below—right now!

BY THE MAKERS OF THE WORLD-FAMOUS ZENITH RADIOS

Look only to your doctor for advice on your ears and hearing

MAIL THIS COUPON TODAY

Zenith Radio Corporation
Hearing Aid Division, Dept. PS68
5801 Dickens Avenue, Chicago 39, Illinois

☐ I enclose check or money order for $75* for one Zenith "75" Hearing Aid. Unless I am completely satisfied and find the Zenith "75" superior to *any* other hearing aid, I may return it within ten days of receipt and get my money back in full.

**Plus tax of $1.50 in Illinois or New York City; $1.88 in California, except Los Angeles, $2.25.*

☐ Please send me free descriptive literature.

Name.....

Address.....

City.....*State*.....

Copyrighted material

SENSATIONAL VALUES IN NEW EQUIPMENT

CRANKSHAFT RE-TURNING TOOL

$19.95

You can re-dress and re-turn crankshaft without removal from engine. Diametic range 1¼ in. to 2½ in. Complete with 25 cutting blades. Blades vary in width according to cut required. Cost U.S. Govt. $65. Complete with metal case. **Only $19.95**

HYDRAULIC VALVE LIFTER UNIT TESTER

For Automotive and Light Aircraft. Complete with 2 Master Hydraulic lifters. Cost the Govt. over $15. Only **$10.50**

ONAN ENGINE REPAIRING KIT

Each kit contains 2 Stellite valves, 12 Stellite valve seats and 4 gaskets. Fits ONAN engines OTC33, 33B and 33H. Valves also fit many other small gasoline engines. Cost the Govt. $4.85. Only **$1.00**

HYDRAULIC CYLINDER

Bore 1-7/16 in., stroke 4 in. Aluminum construction, stainless steel interior. Standard ¼ in. pipe thread connections. Ideal for lifting, bending, tilting, pulling, packing etc. Can be converted into fluid pump, air compressor or air engine. A real labor saver. Only **$2.95**

IMMEDIATE DELIVERIES—All shipments sent Post Paid in U.S. Send check or money order. No C.O.D. Satisfaction guaranteed.

WAAG ENTERPRISES
8409 Wesley Drive **Rocky River, Ohio**

"1948" MODERN MOWER

Available less Engine

ALL PURPOSE Rotary Lawn Mower

- Mows lawns
- Cuts tall weeds
- Trims close—clean
- E-Z adjustable
- Aluminum alloy chassis
- Timken bearing spindle
- 4 Ball bearing wheels
- 20" cut. 1½ h.p. engine

Write for free circular and prices

AIR-ELECTRIC MACHINE CO., INC.
LOHRVILLE, IOWA, U.S.A.

KAYAKS

U-MAK-IT BOATS Easy to Build

Cut-To-Fit for Quick Assembly. Everything Complete plus Illustrated Instructions. No Experience Necessary. Simple as A. B. C.

SEND 25¢ POSTAGE (COIN) TODAY FOR 3 MONEY SAVING ILLUS. CATALOGS Showing all '48 Models (marine plywood) & construction details.

KAYAK BOAT CO. 703 R- WHITTIER ST. NEW YORK 59, N. Y.

ASSEMBLE King Midget

New, low cost transportation. Practical. Safe. A pleasure to drive. Home assembly keeps cost low. Just bolt together our factory built units. Immediate delivery. Send 25c for detailed circular with 8x10 picture, 4-view drawings, price of all parts. Or send for actual Assembly Book with 42 photographs, blueprints, drawings, sketches AND above literature—all for $1 (refunded first order).

MIDGET MOTORS MFG. CO. *Athens, Ohio*

ADJUSTABLE BICYCLE SADDLE BRACKET

New, adjustable Saddle Bracket lowers saddle for use by younger children. Brings saddle down and forward so younger feet can reach and operate pedals safely. Simple, safe, sturdy steel bar. Easy to install and attach saddle. Adjusts 26" bicycle to 24" size. For boys or girls models. Made in ⅝ inch and ¾ inch diameters. Specify diameter desired. Postpaid anywhere in U. S. *Money back guarantee!*

Attractive Dealer Proposition. Write for Details.

CONNIE BERT CO.
8115 Clinton Ave., Cleveland 9, Ohio

BURIED TREASURE, MINERALS AMAZING NEW GOLDAK LOCATORS

SENSATIONAL NEW MODEL!

ONLY 11 pounds weight! One hand operation! Money-Back Guarantee of Superiority. Write for full details.

THE GOLDAK CO.
1544 WEST GLENOAKS BLVD.
GLENDALE 1, CALIFORNIA

World's largest maker of fine locators.

"YOU ARE UNDER ARREST!"

Help Bring Crooks to Justice Through Scientific

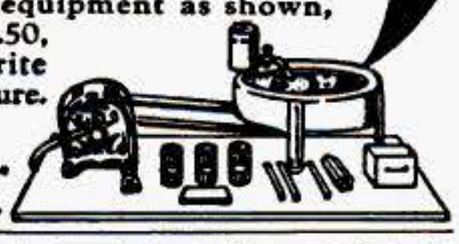
CRIME DETECTION!

We have taught thousands this exciting, profitable, pleasant profession. Let us teach you **in your own home.** Learn Finger Printing, Firearms Indentification, Police Photography, Secret Service Methods thoroughly, quickly, at small cost. Over 800 of all American Bureaus of Identification employ I. A. S. students or graduates. We can prepare you for this fascinating work, during spare time. Write today, **stating age,** for "Blue Book of Crime."

INSTITUTE OF APPLIED SCIENCE, 1920 Sunnyside Ave., Dept. 936-A, Chicago 40, Ill.

make your own Gems 29.50 F.O.B.

All necessary lapidary equipment is furnished, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown, less motor and belt, for only $29.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.



B&I MANUFACTURING CO.
Dept. M — Burlington, Wis.

FALSE TEETH

KLUTCH holds them tighter

KLUTCH forms a comfort cushion; holds dental plates so much firmer and snugger that one can eat and talk with greater comfort and security; in many cases almost **as well as with natural teeth.** Klutch lessens the constant fear of a dropping, rocking, chafing plate. 25c and 50c at druggists. . . . If your druggist hasn't it, **don't waste money on substitutes,** but send us 10c and we will mail you a generous trial box. © I. P. Inc.

KLUTCH CO., Box 4894-F, ELMIRA, N. Y.

Install your own

PRIVATE
Telephone System

With these self-contained magneto ringing phones.

Price, complete with handset and battery

$12.95 EACH F.O.B. DAYTON, O.

Stock No. B-588L

- No external power required. Operates on a standard radio "C" battery. Easy to install - requires only two wires or one wire and ground. Two or more units can be used on the same line.
- You'll find them useful on the farm, on construction projects, in the factory, on broadcast remotes, in your business and wherever you need communication.
- These telephones are not toys. They are Army surplus - slightly used, checked and inspected. Guaranteed to be in excellent condition. Dimensions: $5\frac{1}{4}$" x $6\frac{1}{4}$" x $9\frac{1}{2}$". Shipping weight 16 lb.

SEND CHECK OR MONEY ORDER.

SREPCO
STANDARD RADIO & ELECTRONIC PRODUCTS CO.
135 E. SECOND ST DAYTON 2, OHIO.

35mm FILM for

LEICA, KODAK, ARGUS

and other similar cameras

ANSCO Fino Pan, Ultra Speed and Supreme

KODAK Plus X, Super XX and Background X.

DUPONT Superior No. 2 and Superior No. 3

ONLY $1.40 per 100 ft. ROLL

Each roll of film contains 18 strips of 36 exp.—properly notched.

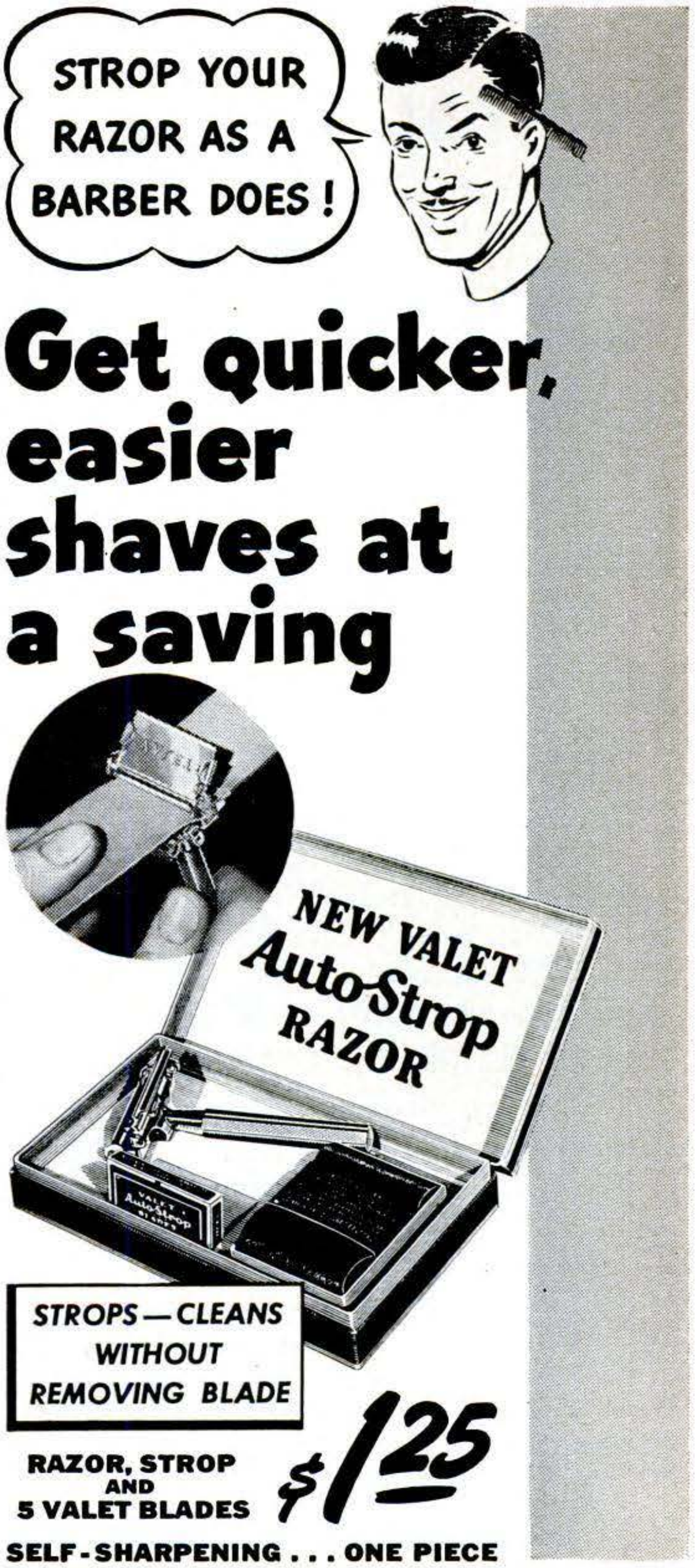
Supplied on Reels in Metal Cans

All Film Guaranteed—Immediate Delivery

Send $1.40 for each 100 ft. roll and we will ship your film immediately. We pay postage.

New Plastic Cartridges, 10c ea.

Eight-Sixteen Films, Inc., 630 Ninth Ave., Dept. PS-6, N.Y. 19, N.Y.

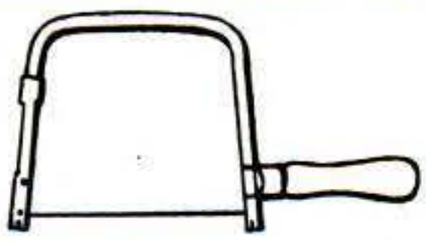


THE ONLY SAW BLADE THAT CUTS IN ALL DIRECTIONS WITHOUT TURNING WORK OR SAW

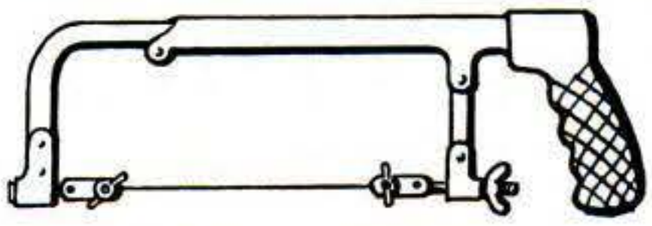
TYLER *Spiral* SAW BLADES

Saws in any Direction for Most Intricate, Difficult Patterns... Oil-tempered spring steel wire blade...outlasts other type blades

At Your NEAREST HARDWARE STORE
Or order direct today. Prompt shipment
Your money back if not delighted.



COPING SAW.. Entirely new, better way of sawing ..Only coping saw blade that cuts plastics .wood...metal with absolutely clean, even edges. Won't tear. Now ..anything you can draw ..you can saw 360° cutting blade 1 coping saw frame 5 spiral blades, complete . only **$1.00**



REVOLUTIONARY SPIRAL HACKSAW BLADE. Cuts iron, steel, bronze, brass, aluminum, plastics any direction. Only blade that cuts tubing without tearing or grabbing. For intricate internal work . before impossible. Fits any standard frame. Merely slip adapters over pins. Length 10" 2 blades and pair of adapters . a real buy. . only **39¢**

TYLER MANUFACTURING CO. 938 PICO BOULEVARD SANTA MONICA, CALIF

YOUR BLADES ARE THE ANSWER TO MY CUTTING PROBLEMS..SEND AT ONCE..SAWING IS BELIEVING

TYLER MFG. CO. — 938 Pico Blvd., Santa Monica, California, Dept. S-6

Please Rush ☐ Send 1 coping saw frame 5 blades (enclosed $1.00) ☐ Send 2 hacksaw blades and pair adapters (enclosed 39¢)

☐ Send BOTH — 1 coping saw frame 5 blades plus 2 hacksaw blades and pair adapters complete (enclosed $1.39)

NAME _____

ADDRESS _____

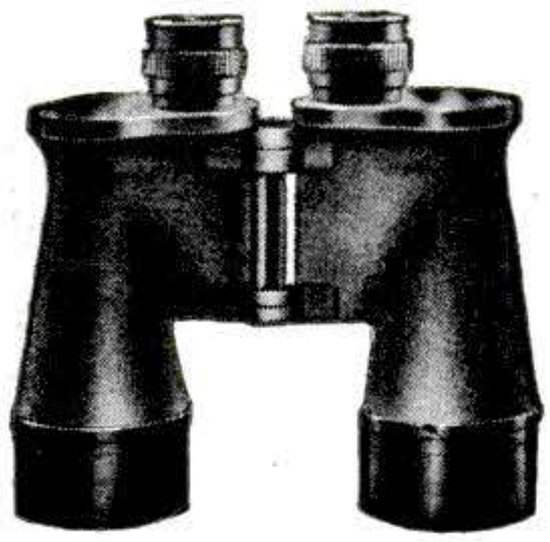
CITY _____ STATE _____

Copyrighted material

WAR SURPLUS OPTICAL BARGAINS

ASSEMBLE YOUR OWN BINOCULARS!

Save More Than 1/2 Regular Cost



GOVERNMENT'S 7x50 BINOCULARS

Complete Optics!

Complete Metal Parts!

We supply Full Instructions

METAL PARTS—Set includes all Metal Parts—completely finished—for assembly of 7 X 50 Binoculars. No machining required. Bodies have been factory hinged and covered. A sturdy Binocular Carrying Case is optional with each set of Metal Parts.

Stock #842-N $39.40

Postpaid, plus $4.80 for Case—**Total $44.20**

OPTICS—Set includes all Lenses and Prisms you need for assembling 7 X 50 Binoculars. These are in excellent condition—perfect or near-perfect—and have new low reflection coating.

Stock #5102-N . . . . . $25.00 Postpaid

NOTICE! If you buy both Binocular Optics and Binocular Metal Parts, add 20% Federal Excise Tax to above prices.

ARMY'S 6x30 BINOCULARS

COMPLETE OPTICS & METAL PARTS—Model M-13A1, 6 x 30 Binoculars (waterproof model). Everything you need—ready for assembly. When finished will look like a regular factory job costing $102 to $120. The Optics are new, in perfect or near-perfect condition. Have new low reflection coating. Metal Parts are new and perfect, all completely finished. No machining required. Bodies factory hinged and covered. Complete assembly instructions included.

Stock #830-N . . . . . $40.00 Postpaid. plus $8.00 tax—Total—$48.00

TERRIFIC BARGAIN—BUBBLE SEXTANT

These Army Air Forces Bubble Sextants cost Govt. about $125 each. Bargain at our price of $12.50. Wooden carrying case included. Wartime used but COMPLETELY REPAIRED AND COLLIMATED. Return within 10 days for full refund if dissatisfied. Directions for use accompany shipment.

Stock #924-N . . . . . $12.50 Postpaid

Same SEXTANT as above, but BRAND NEW and with Automatic Averaging Device and Illuminated Averaging Disc for nighttime use. Govt. cost $217. Perfect working order guaranteed.

Stock #933-N . . . . . $22.50 Postpaid

6 POWER GALILEAN TELESCOPE—(Commercial Surplus) 28mm dia. Achromatic Objective Lens. Sturdily constructed of Aluminum. 7" long, extends to 9". Complete with carrying case.

Stock #941-N . . . . . $3.00 Postpaid

We have literally millions of war surplus lenses and prisms for sale at bargain prices ranging 10c and up. Write for Catalog "N" — Sent Free!

Order by Stock No. ***Satisfaction Guaranteed***

EDMUND SALVAGE COMPANY

P. O. AUDUBON, NEW JERSEY

Distributor's **SURPLUS**

INTER-COM. SYSTEM

NEW! Made by ***DICTOGRAPH!***

$9.75 Complete 2-Unit Set

Has "Good Housekeeping" Seal of Approval

Use from

- **Room to room**
- **House to garage**
- **Home to home**
- **Store to stockroom**
- **Office to factory**
- **Farmhouse to barn**

Not a Toy but a Two-way Communication system anyone can operate. Compact and attractive—ready to install. Clear reception. Nothing to tune in or adjust. Sturdy precision-built in metal case. Portable, easy to move.

Manufactured by nationally famous Dictograph Products, Inc. Thousands in use—New and mechanically perfect. Soon pays for itself. Complete with TWO UNITS, 4 flashlight batteries, 50 ft. wire. Order today— Limited supply. Special sale at $9.75. Send check or money order, we pay postage. $3.00 deposit on C.O.D.'s.

ORDER NOW!

KINNEY BROTHERS
202 N. Avenue 18
Los Angeles 31, Calif.

Members of Los Angeles Chamber of Commerce 50 years.

SUPER QUALITY

Surplus Sale

VISES and CLAMPS For Mechanics & Home Craftsmen

Never before such values! First time these *nationally famous* tools are offered direct-by-mail. Brand new — rugged. None finer.

ALLOY STEEL VISE: Combination swivel and bench type base. 3½" superhardened serrated steel jaws open automatically to 4½" by trigger action. Quick ratchet screw closing; built-in pipe grip. Many other features. Regular price $24.30. **Now only $14.95**

DUAL GRIP MALLEABLE IRON CLAMP: Holds on any surface - won't shift or creep. Two sizes: 3" opening (was $4.00) now only **$1.95.** 4" opening (was $4.50) now **$2.25**

ORDER TODAY - quantity limited. Enclose check or money order. We pay shipping charges. ***10 day money back guarantee.***

ALL BUSINESS COMMODITIES, INC.
Dept. AG. 4656 W. Rice St. Chicago 51, Ill.

FOR 33 YEARS— *BEST TIRES— LOWEST PRICES*

98% NON SKID, ORIGINAL TREAD DEMONSTRATORS. TRIPLE PINPOINT INSPECTED. NOT RECAPS

18 MONTH, INSURED GUARANTEE BOND

600-16	$ 6.10	700-15	$ 6.30	550-16	$ 5.10
650-15	5.10	700-16	6.70	525-18	6.10
650-16	6.20	750-16	7.70	550-17	6.10
32x6- 8	$12.00	8.25-20	$16.00	750-20HD	$13.00
32x6-10	14.00	9.00-20	16.50	10.00-20	16.70

750-20 8 PLY MILITARY SUPER $14

WE'VE SHIPPED A MILLION TIRES, MADE A MILLION FRIENDS. SEND CK. OR M.O. & SAVE C.O.D. CHGS.

Blatt Tire, Cor. Girard & Lancaster Ave.,

BLATT BLDG. DEPT. S PHILADELPHIA, PA.

New Designs in FRANZITE GRIPS

Modernize Your Gun! Improve Your Score!

Most durable grips made. Positively unbreakable! For Colt, Smith & Wesson, Hi-Standard. Ortgies, Luger & Mausers in a wide choice of beautiful designs in ivory, pearl, walnut, onyx, etc. Low prices. FREE CATALOG. Dealers Wanted.

SPORTS, INC., (Mfrs.) 5501 Broadway, Dept. S-6, Chicago 40, Ill.

MANY NEVER SUSPECT CAUSE OF BACKACHES

This Old Treatment Often Brings Happy Relief

Many sufferers relieve nagging backache quickly, once they discover that the real cause of their trouble may be tired kidneys.

The kidneys are Nature's chief way of taking the excess acids and waste out of the blood. They help most people pass about 3 pints a day.

When disorder of kidney function permits poisonous matter to remain in your blood, it may cause nagging backache, rheumatic pains, leg pains, loss of pep and energy, getting up nights, swelling, puffiness under the eyes, headaches and dizziness.

Don't wait! Ask your druggist for Doan's Pills, a stimulant diuretic, used successfully by millions for over 50 years. Doan's give happy relief and will help the 15 miles of kidney tubes flush out poisonous waste from your blood. Get Doan's Pills.

Copyrighted material

Buy a CARLSON RULE *and Save Money!*

WITH 10-SECOND BLADE CHANGE

SAVE 50% BY GETTING AN EXTRA BLADE

With a Carlson Rule you can buy an extra blade for about ½ the cost of a new rule. When a blade is accidentally damaged or numerals become worn, you don't have to buy a new rule. Just get an extra blade and insert it without opening the case. Presto, in 10 seconds, a "new" rule for ½ the cost!

CARLSON & SULLIVAN, INC., Monrovia, Calif.

CARLSON STEEL TAPE RULES

EVERY TYPE OF METAL for EVERY TYPE OF SHOP

- **STAINLESS STEEL**
- **TOOL STEEL**
- **ALUMINUM**
- **BRASS**

FREE *New Catalogue & Price List*

Write **BESSEMER STEEL CO. of AMERICA**
Dept. CG-18, 3417-25 W. 27th St., Chicago 23, Ill.

WORLD'S LOWEST PRICED

ADDING MACHINE

VEST POCKET SIZE

IDEAL FOR BUSINESS OR PERSONAL USE

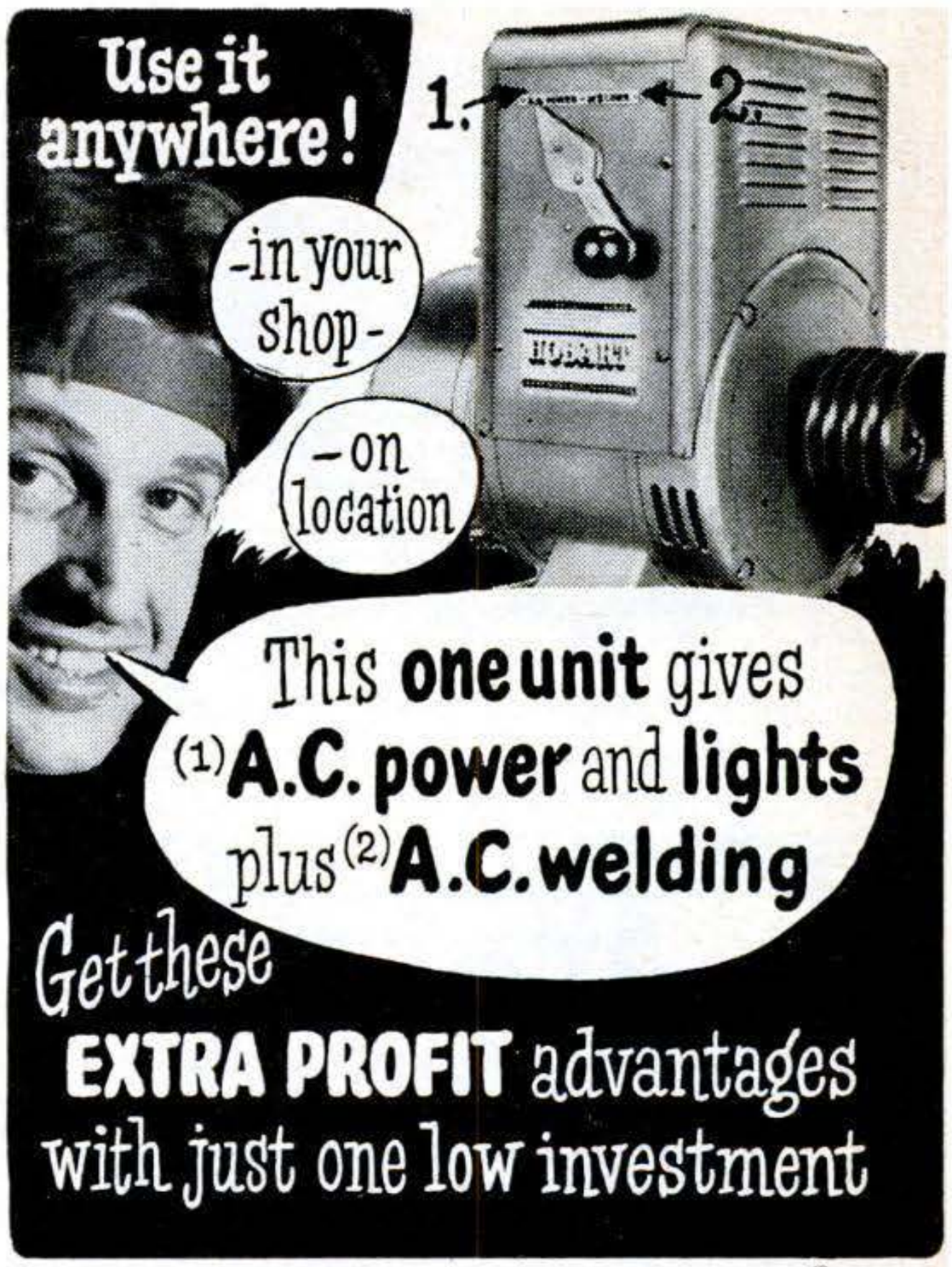
FREE TRIAL
ONLY $2.95 TOTAL COST
SEND NO MONEY

FREE!! Each Baby Calculator in Beautiful, rich-looking Leatherette case—at no extra cost.

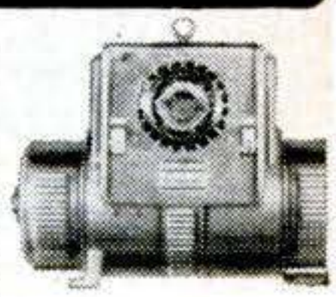
Fits vest pocket or purse. Guaranteed accurate. Operated as easily, and as reliable, as machines costing many times as much. Not a toy. **Precision made, very durable—guaranteed for life against defects in construction.** You positively can't buy a calculator of equal quality for as little money. **ACCEPTED AS THE FINEST LOW PRICED CALCULATOR FOR OVER 35 YEARS!** Operates with a flick of your finger. Adds, subtracts, multiplies, divides—counts up to one billion. Pays for itself over and over in mistakes avoided, and time saved. **MAKES IDEAL GIFT.**

Sold on a positive money back guarantee. Send only $2.95. Calculator sent postpaid, or send name and address and pay postman $2.95 plus postage. **MONEY BACK IN 10 DAYS IF NOT DELIGHTED!** (If outside U. S., send $3.50.) **AGENTS WANTED.**

CALCULATOR MACHINE CO., Mfrs.)
Dept. 501, P. O. Box 248, Glenview, Illinois

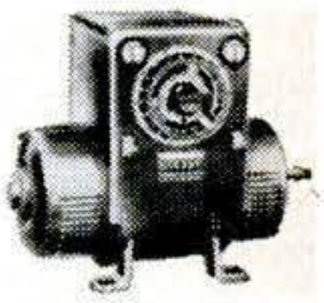


Make More $$$ With Alternating Current Welding. Do arc welding anyplace with this portable gas engine drive A.C. Arc Welder. In the shop or in the field you'll find more welding advantages in this newly developed rotary A.C. Ideal in the field where electric power is not available, especially for inert-gas-shielded arc welding requiring A.C. for hard to weld metals.



Electric Drive

Save More $$$ With Alternating Current Power. This same machine is converted, by simply flipping a switch, to a portable Alternating Current Power Unit to furnish lights and power to operate electrical tools and equipment. A real value in case of normal power failure—prevents loss of production time, makes you independent of power supply.



Build Your Own

You Can "Build Your Own" Or Buy Complete. You can buy this unit as a generator only for connecting to your own power source or you can buy it complete, ready to go to work. Either way you get a combination alternating current arc welder and alternating current power unit. Two machines built into one and for a little more than the price of one. Return coupon today for information on this revolutionary new machine. It can make and save you many $$$.

AC Welder

HOBART BROTHERS CO., Box P-68, Troy, Ohio

Hobart "one of the world's largest builders of arc welders"

Hobart Trade School

Yes... I want to know more about...

—the new Hobart A.C. Arc Welder and A.C. Power Unit Combination.
Send information on items checked:

FREE! Vest Pocket Guide.. ☐

- ☐ A.C. Welder-A.C. Power
- ☐ Industrial A.C. Welder
- ☐ Build Your Own D.C. Welder
- ☐ Shop Type A.C. Welder
- ☐ Shaft Extension Electric Drive
- ☐ Hobart Trade School

Hobart Brothers Company, Box P-68, Troy, Ohio

Name _____

Address _____

City _____ *State* _____

Copyrighted material

NEW SERIES 16 IMPROVED NO-DRIFT FM

in the Sensational 1948

MIDWEST • RADIOS •

Separate Chassis Like the Powerful Series 16 AM-FM Above, or Beautiful Radio-Phono Consoles Available

The SYMPHONY GRAND RADIO-PHONOGRAPH AM-FM CONSOLE

A truly magnificent instrument that offers new, improved No-Drift FM, 5 Wave Bands, Automatic Intermix Record Changer that handles both 10" and 12" records, 14½" Panasonic Speaker, and exclusive Midwest Tri-Magnadyne Coil System and Color-Ray Tone Selection. Luxurious Cabinets. Other Console and Table Models with Series 16, 12, and 8 Chassis.

EASY TERMS — 30 DAYS TRIAL

SEND FOR FREE Catalog — BUY DIRECT FROM FACTORY AND SAVE

FILL IN COUPON AND MAIL TODAY OR JUST SEND YOUR NAME AND ADDRESS ON 1c. POSTCARD

MIDWEST RADIO CORPORATION
Dept. 24-A, 909 Broadway, Cincinnati 2, Ohio
Please send me your new FREE 1948 Catalog.

NAME .....

STREET .....

CITY ..... ZONE .... STATE .....

32 DRAWER UNIT $4.95

64 DRAWER $8.95

for home or shop

THE JIFFY metal CABINET

With Laminated Fibre Board Drawers

THE HANDY WAY TO KEEP SMALL PARTS, WASHERS, NAILS, SCREWS, NUTS, BOLTS AT HAND

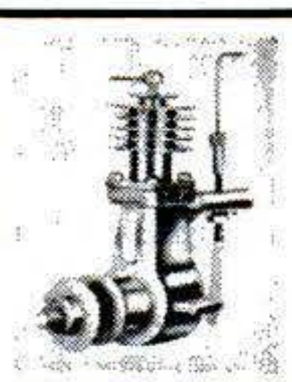
Approximate **DRAWER SIZE**
1¼" Deep
3" Wide
6" Long

CABINET SIZE
32 Drawer Unit
6" Deep
12¾" Wide
15¼" High
Shipping Weight approx. 9 lbs.

64 Drawer Unit
6" Deep
25½" Wide
15¼" High
Shipping Weight approx. 18 lbs.

For small items, the low-cost Jiffy Cabinet, 32 or 64 drawer units that put office, shop, work bench, household and hobbyist needs at your fingertips. Metal flange drawer guides. Spot welded metal cabinet with laminated fiberboard drawers insures long time-saving service. Why fumble? With the Jiffy you know where it is. 32 drawer unit—$4.95; 64 drawer unit—$8.95. Send check or money order—No C.O.D.'s please. Ohio orders please add 3% Sales Tax. Shipping charges Parcel Post Collect.

KAYTEE PRODUCTS
Dept. S • Box 588 • Canton, Ohio



REAL DIESEL ENGINE

For Model Planes, Boats and Race Cars. Now you can own and run a real miniature Diesel engine that operates by the heat of compression. No coil, condenser, wires, or annoying ignition failures. Simply flip the prop or flywheel to start. It's the new DEEZIL—a .125 cu. in. displacement, 5 oz. engine that runs at 8000 RPM. Order today; only $12.95 p.p., less tank. Every engine fully tested and guaranteed. DEEZILMIX FUEL $1.00; PROP 50c.

Send For Valuable Free Price List!

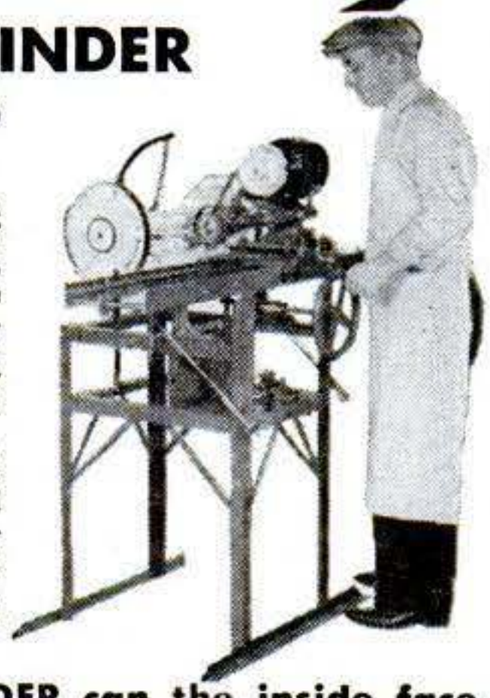
GOTHAM HOBBY CORP.
107 East 126th Street — New York 35, N.Y. — Dep't S

EARN BIG MONEY AND BE YOUR OWN BOSS

Sharpening Lawn Mowers

THE UNIVERSAL GRINDER

PUTS YOU INTO BUSINESS WITH SMALL INVESTMENT



Earn as much as $400.00 a month in your basement or garage. Mr. Felber of Ind., writes, "MY UNIVERSAL GRINDER is faster and more accurate than any other grinder. Its efficiency enabled me to sharpen 450 mowers in 4½ months. More than paid for itself the first month. Every customer satisfied." Mr. Hardy of Mississippi writes, "Received my Universal Grinder the first part of May and by August 18 had sharpened over 1000 mowers." Mr. Bacon of California writes, "The lawn mower business, with my Universal Grinder, has been a gold mine these last two years."

Only on the UNIVERSAL GRINDER can the inside face, the edge of the stationary blade, and the reel blades, be ground to proper clearance *ALL IN ONE SET-UP* WITHOUT REMOVING ANY BLADE FROM THE MOWER

Free Folder

Rogers Mfg. Co., Dept. P-68, Lindsey, Ohio

Cornelius AIR COMPRESSOR

• Brand new. 1/3 hp 27 volts DC-AC. 3 stage piston type. 1500 lbs. per sq. inch rated pressure. 20 AMP series wound motor. Equipped with fan for cooling. Approx. 2 cubic feet of air per minute, can be used direct from Delco system. Can be adapted to 110 AC with 27 volt transformer. Perfect for low-pressure paint spray guns, inflating tires, spraying trees, air horns, laboratory use, etc. Shipping wght. approx. 25 lbs. Cost Govt. over $200.00. Our price, FOB, K. C., Mo., only **$17.95**

TRANSFORMERS: New. 27 volt, for use with compressor or other uses. Weight 20 lbs.
Our price, FOB, K. C., Mo., only **$14.95**

Write for latest circular of surplus bargains

NATIONAL SURPLUS SALES CO. 723 E. 18th Street Kansas City, Mo.

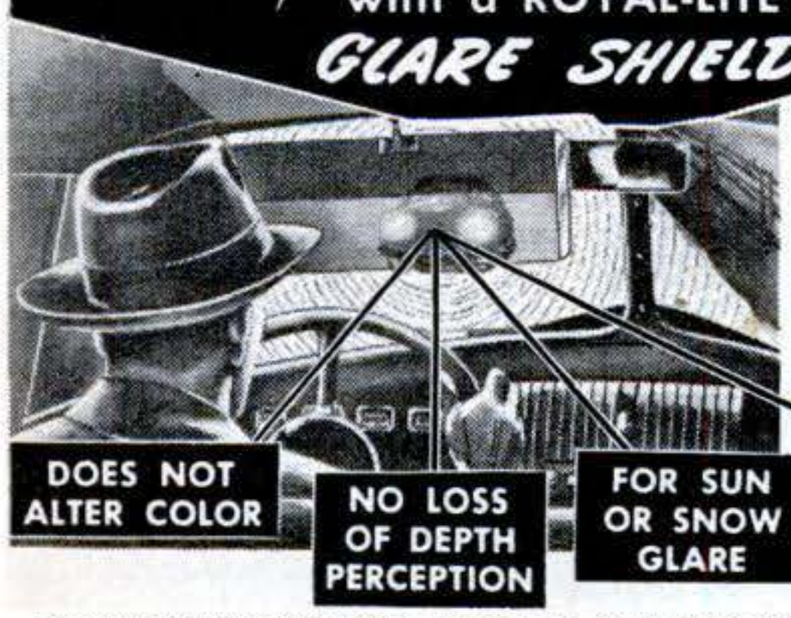
SIGNS AND SHOWCARDS EASILY AND EXPERTLY PAINTED WITH LETTER PATTERNS

MANY SIZES & STYLES WRITE FOR FOLDER!

JOHN F. RAHN
1330-33 N. CENTRAL AVE.
CHICAGO 51, ILL.

Copyrighted material

REDUCE GLARE DAY OR NITE with a ROYAL-LITE GLARE SHIELD



Reduce Glare *without impairing vision*

DRIVE WITH GREATER EASE NIGHT AND DAY!
Reduce eye strain caused by headlights, sun, haze, fog, rain or snow, with the new Royal-lite glare shield.

DEALERS WANTED

Optometrically correct
No loss of depth perception
Shows natural colors
Adjustable for height
Easy to install

Write for additional information.

ROYAL-LITE SENIOR 6" x 14"..... $4.95
ROYAL-LITE JUNIOR 4" x 8"..... $1.95

Order direct—TODAY—Postage prepaid when remittance accompanies order.

ROYAL-LITE SALES CORPORATION
Suite 211, Dept. S, 1007 S. Grand Ave., Los Angeles 15, Calif.

DUAL TAIL PIPE EXTENSION

Fits all cars—chrome plated

DEEP TONE
produced by 2½ inch outlets
Postage free on prepaid orders
DEALER INQUIRIES INVITED

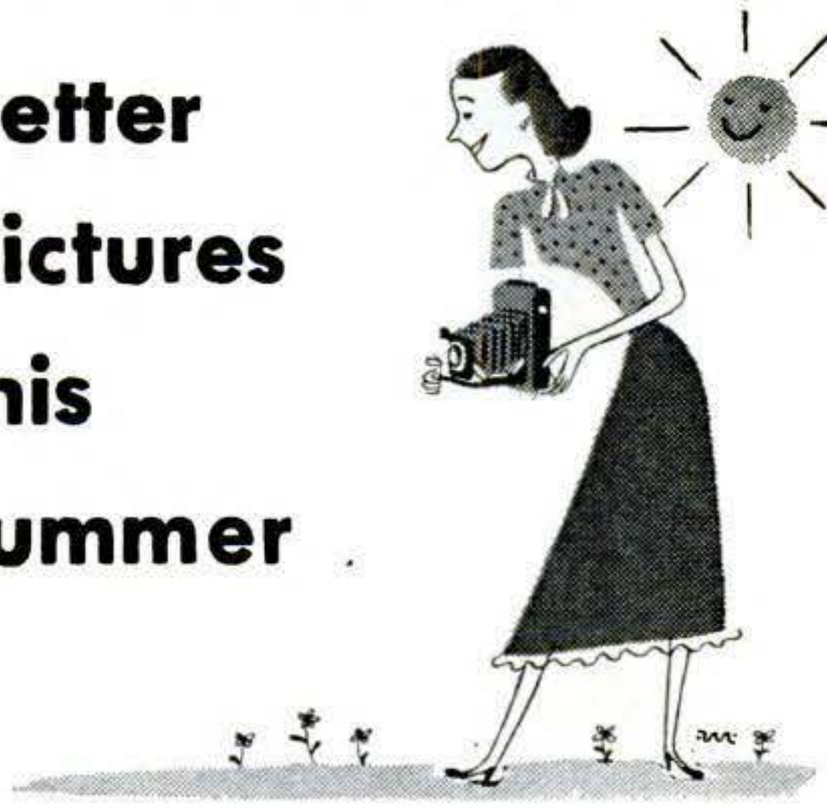
$2.95

LYONS PRODUCTS COMPANY
Pat. Pend. 2319 Ridgeley Drive, Dept. PS-6, Los Angeles 16, Calif.

PLASTIC TOYS

IDEAS OR FINISHED ITEMS
applicable for children from one to five years
WANTED
by a well-rated manufacturer of high reputation, on royalty basis; would consider buying outright. General information in first letter.
Address: PLASTIC, Box 27, Arlington, N. J.

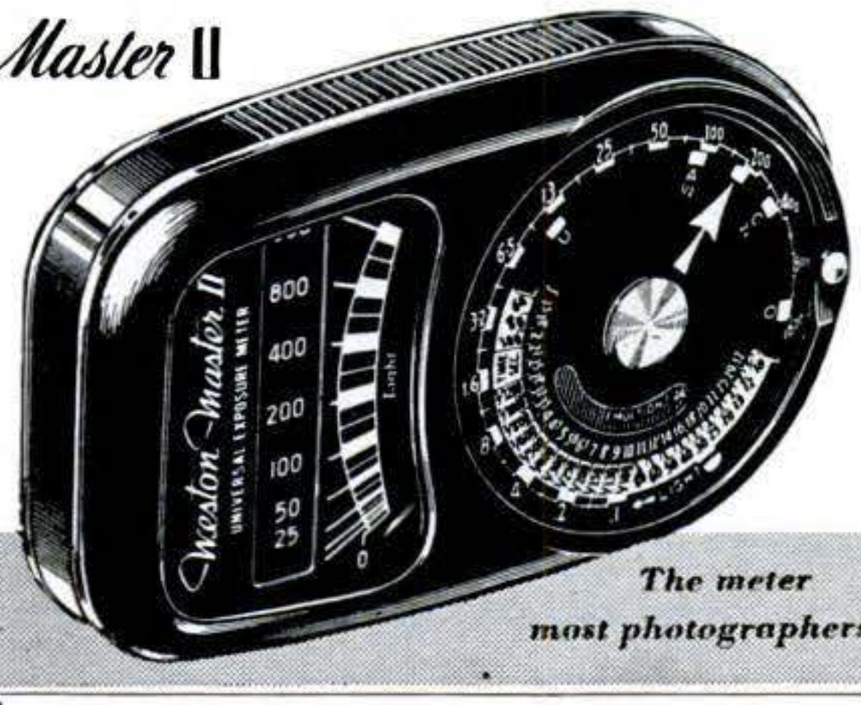
Better pictures this summer



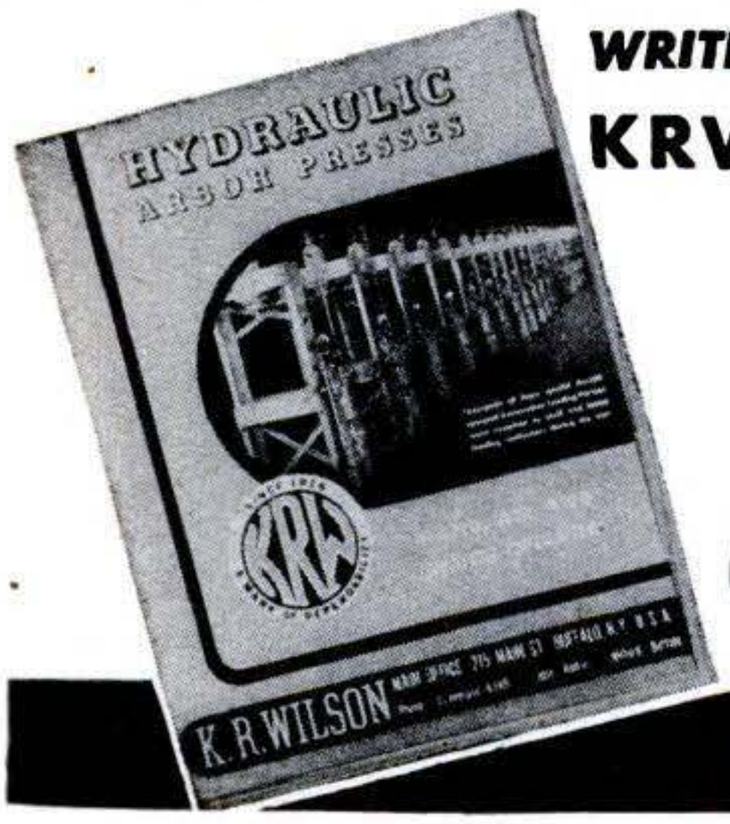
WESTON
EXPOSURE METER

When picture-taking is most inviting but light conditions most annoying, a WESTON prevents disappointments and film waste. It gives correct camera settings regardless of light conditions, assuring brilliant pictures every time. Used with still or movie cameras, all film including color. At dealers everywhere.

Master II

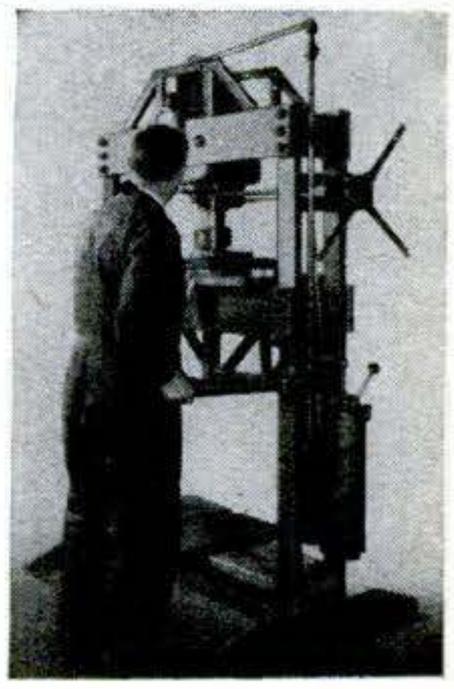


The meter most photographers use



WRITE FOR YOUR* FREE *COPY OF THE NEW
KRW HYDRAULIC PRESS BOOK

Describes all manner of Production and Shop Work on KRW Hydraulic and Bench Type Arbor Presses. 32 pages illustrating the new KRW Hand-operated, Electric-operated and Air-operated Hydraulic Presses.
Write for your copy today.



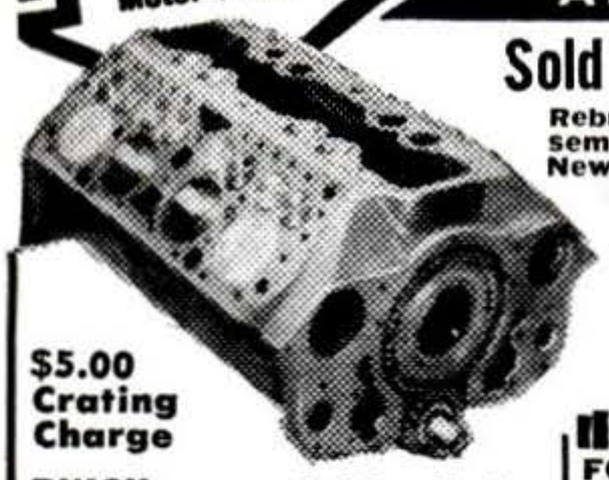
K. R. WILSON, DEPT. 54, 215 MAIN ST., BUFFALO 3, N. Y.

Copyrighted material

Carries the Same 90 DAY GUARANTEE As a New Motor Assy.

Our Finest Precision REBUILT

MOTOR BLOCK ASSEMBLIES



Sold Outright or Exchange

Rebuilt by skilled mechanics. Assembly has Rebored Block with New Pistons, Pins, Rings, Reground Crankshaft, and all New Bearings. Guaranteed 90 Days.

Allowance on Old Motor

We ship at outright price. Send your motor prepaid, must be suitable for rebuilding. Send in notarized bill of sale showing title number if any. We refund difference when we receive your motor.

$5.00 Crating Charge

BUICK	Outrt.	Exch.
34-47 8 cyl.	$199.00	$160.00

CHEVROLET	Outrt.	Exch.
29-47 6 cyl.	117.50	87.50

CHRYSLER	Outrt.	Exch.
34-47 6 cyl.	162.50	130.00
35-47 8 cyl.	199.00	160.00

DE SOTO	Outrt.	Exch.
34-47 6 cyl.	162.50	130.00

DODGE—3¼" bore		
33-47 6 cyl.	144.00	109.00
3⅜" bore	Outrt.	Exch.
34-47 6 cyl.	162.50	130.00

FORD	Outrt.	Exch.
28-31 4 cyl.	119.00	87.00

FORD	Outrt.	Exch.
32-34 V8	$139.00	$99.00
35-47 V8	149.00	99.00

HUD.-TERRA.	Outrt.	Exch.
35-47 6 cyl.	175.00	135.00

MERCURY	Outrt.	Exch.
39-47 V8	149.00	99.00

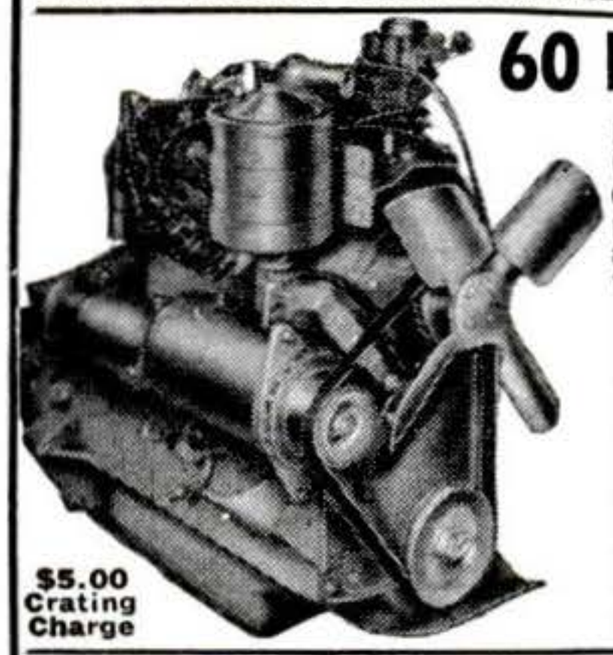
OLDSMOBILE	Outrt.	Exch.
37-47 6 cyl.	175.00	135.00
35-47 8 cyl.	199.00	160.00

PLYMOUTH	Outrt.	Exch.
33-47 6 cyl.	139.00	109.00

PONTIAC	Outrt	Exch.
37-47 6 cyl.	175.00	135.00
35-47 8 cyl.	199.00	160.00

STUDEBAKER	Outrt.	Exch.
35-47 6 cyl.	175.00	135.00
35-47 8 cyl.	199.00	160.00

We Can Supply REBUILT ENGINES, TRANSMISSIONS, REAR ENDS etc., for Cars and Trucks. Also JEEP ENGINES. Write for Prices!



60 HP. JEEP Engines

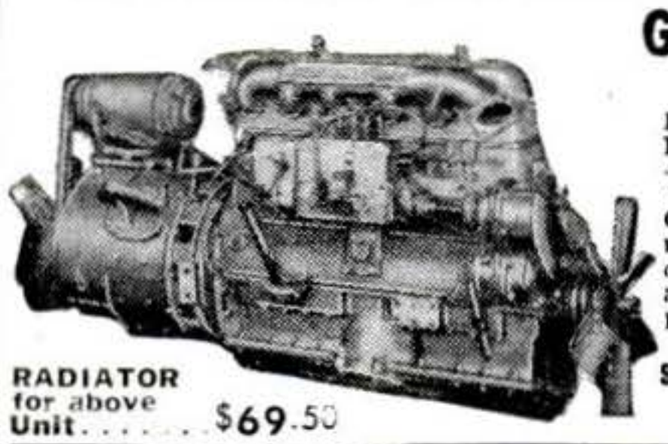
Reconditioned, Tested and Guaranteed in perfect running order and ready to run. Every part is checked to be perfect and carries a 90 Day Guarantee same as a new engine.

COMPLETE with . . . Generator, Starter, Distributor, Coil, Fan and Fan Belt, Water Pump, Fuel Pump, Intake and Exhaust Manifolds, Carburetor, Oil Filter, Spark Plugs, Flywheel, Clutch and Pressure Plate, and Wiring.

$5.00 Crating Charge

Outright, SG58R-003, Each $198.50

65 KW. 225 Volt D.C. DIESEL ELECTRIC GENERATING UNIT



RECONDITIONED

Equipped with 6 cyl. DRXB Hercules DIESEL engine. 4⅜" bore. 5¼" stroke. 120 H.P. at 2000 R.P.M. Complete with injector, pump, nozzles and electrical equipment. Generator attached to engine. Complete as shown.

RADIATOR for above Unit $69.50

SG60R-193 Each $1095.00

SEND 25% CASH WITH ORDER, BALANCE C.O.D.

J.C. WHITNEY & Co.

1919 Archer Ave. Chicago 16, Ill.

PIPE CENTERS for Lathes

Fit head or tail spindles. Centers revolve on shank.

No.	For Pipe	Shank Req'd	Price
2160	½" to 3"	2172-NR or	$4.50
2161	3" to 5"	2172-TH	6.00
2162	5" to 8"	2173-TH	9.00

Shank 2172-NR	No. 2 Taper	$4.50
Shank 2172-TH	No. 3 Taper	4.50
Shank 2173-TH	No. 3 Taper	7.50

f. o. b factory

SOUTH BEND LATHE WORKS 456A E. Madison St. South Bend 22, Ind.

Jiffy Jr. ELECTRIC HEATER

BOILING HOT WATER IN A JIFFY!!

Place the Jiffy Electric Water Heater into the water and insert the plug in the nearest electric wall or light plug. You will have hot water in less than five minutes for baby's bath, your washing, shaving and a great many other uses in the home, camping, business, and on the farm. Mailed complete, including six feet of rubber covered wires and plug. One year guarantee. **JIFFY ELECTRIC COMPANY, Dept. W4, 21321 Stephenson Highway, Hazel Park, Mich.**

Only $2.95 plus twenty five cents for postage

HOT WATER IN A JIFFY

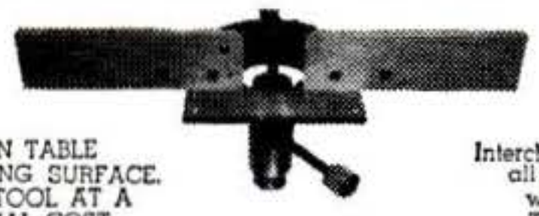
BUILD HEAVY DUTY MACHINES

SAVE UP TO 90% You can build, using our practical, easy-to-read plans, all kinds of machines, for home, farm or shop—scooters, portable sawmills, metal working machines, concrete machinery of all kinds, printing equipment, woodworking machines, midget autos, dish washers, farm equipment, freezers, tractors.

FREE CATALOG HANDBOOK 183 SETS OF PLANS VALUABLE INFORMATION

NICHOLS EQUIPMENT COMPANY Dept. D-1204, PURVIS, MISS.

NEW SPINDLE SHAPER



$34.50 (Less Fence)

MOUNTS IN YOUR OWN TABLE FOR MAXIMUM WORKING SURFACE. A STURDY PRECISION TOOL AT A FRACTION OF THE USUAL COST.

Interchangeable spindles to fit all standard cutters. Comes with ½" size, others $3.50 Takes cutters to 3¼" dia.

Hi-speed sealed ballbearing arbor.

Fast, simple spindle height adjustment with lock; travel, 1¼". Accurately made maple faced fence, fully adjustable; length 24" $42.50 as shown. Conventional models available. Request folders.

STEWART ENGINEERING CO. P.O. Drawer 145, Soquel, California

Cash orders sent prepaid. C.O.D. 25% deposit. Calif. add 2½%

BUILD an ELECT. LAWN MOWER

PLANS ONLY 35¢ WRITE TODAY

Make this Battery-Driven Rotary-Blade mower from an old auto generator and inexpensive parts. Cut forward, backward, grass or weeds, any height. Plans complete, easily followed.

LEJAY MFG. CO., 823 LeJay Bldg., Minneapolis 8, Minn.

ELECTRIC SHEAR SHARPENER

OVER 45,000 SOLD—IT MUST BE GOOD!

Genuine Carborundum wheel ideal for shop or home use. Send remittance with order and shipment will be made at once, prepaid to your door, complete with electrical goods catalogue.

Motor driven **$9.75** complete with vise

WILLIAM MARVY COMPANY, Dept. 7
479 St. Peter Street St. Paul 2, Minn.

BENJAMIN

AIR RIFLES — AIR PISTOLS

PIONEERS - LEADERS

SEND FOR FREE FOLDER OF LATEST MODELS TODAY

If you want a **REAL GUN** for **PRACTICAL USE** inside or outdoors get a **SAFE - CLEAN - ECONOMICAL - BENJAMIN** with Adjustable Power and Amazing Accuracy. For **BEST RESULTS** use **BENJAMIN H-C PELLETS. WRITE AT ONCE.**

BENJAMIN AIR RIFLE CO., 811 MARION ST., ST. LOUIS 4, MO.

SPECIAL! LOW PRICES ON-

Natural Rubber Latex FOR BETTER MOLDS

HOW to Make ART OBJECTS with RUBBER MOLDS

This new molding compound with 70% natural rubber concentration is easier to use, gives cleaner, sharper, more profitable castings. Order now at these low prices: $3 Qt., $5 ½-Gal., $8.50 Gal., $7.50 per Gal. in 5-Gal. Cans. Send check or m.o. New Molding Manual sent with each order.

FRANCIS RUBBER PRODUCTS CO.
Dept. F-2, 1836 E. Fulton Columbus 9, Ohio

Copyrighted material

NONE BETTER AT ANY PRICE!

PAINT YOUR CAR WITH KAR-WIPE

NEW AUTO ENAMEL SENSATION

GUARANTEED 2 FULL YEARS $1.95

WIPE IT ON! NO SPRAYING! NO BRUSHING!

No Lap Marks

No Masking

No Streaks

YOU CAN DO A FACTORY LIKE JOB

One Quart Covers Average Car With Two Gleaming Coats. A Glowing Professional Finish!

Not a streaky wax or polish. KAR-WIPE is the new miracle high lustre auto enamel that is so easy to use. Anyone can do a professional looking job quickly.

Almost anyone can get high-gloss job that looks like a Professional finish. KAR-WIPE does the trick! Easy to apply! No brush! No masking! Simply WIPE IT ON with the applicator that we give you FREE. Get a factory-like finish that's GUARANTEED against chipping, cracking, peeling, fading when simple directions are followed. Dries dust free quickly. In newest colors.

SEND NO MONEY! Order one or more quarts today. Just mail postcard Pay postman plus C.O.D. upon delivery. Send remittance, save postage.

SEND NO MONEY! ORDER Kar-Wipe TODAY!

In Black, Grey, Firey Red, Brewster Green, Washington Blue, Maroon . . . $1.95 per qt.

KAR-WIPE CO., Dept. PS-6, 828 S. 18th St., St. Louis, Mo.

NEW *Electric* SANDER

Only $14.85 POSTPAID

Amazing MOTO-SANDER

Saves Time — Saves Effort

Now Sanding is Fun! Dremel has developed an **electric** Sander for home or shop . . . so easy to handle that a child can use it. New, inexpensive **"Moto-Sander"** delivers 7,200 strokes a minute. (Short, rapid stroke frees dust from sandpaper . . . makes it last longer.) **Moto-Sander** does a magically smooth job of sanding . . . gets into places other sanders can't reach. Rubber cushioned sanding pad measures 2¼" x 5½". Cam-Type-Clamp paper holder permits changing sandpaper in seconds. **Moto-Sander** has only two moving parts . . . never needs oiling . . . weighs only 2½ lbs. Stroke adjustment compensates for changes in voltage. Uses 110-120 volt A.C. (only). Gives no radio interference. Comes with 8 ft. (Underwriters' Approved) rubber cord plus 6 sheets assorted grade Garnet paper, plus ⅛" thick felt pad for wax polishing.

Fine Finish—Fast!

Use **Moto-Sander** to get satin smooth finish on woodwork, stairways, doors, furniture; ideal for sanding boats, gun stocks or scale models. Just guide it. Uses #2/0 Garnet paper or finer. For speedy, effortless **polishing** of waxed furniture and other surfaces, use felt pad (furnished) in place of sanding paper. **Moto-Sander** is the lightest, most practical electric sander on the market—**the only one of its kind.**

MONEY-BACK GUARANTEE: If your dealer does not yet have **Moto-Sander,** send only **$14.85** . . . we'll pay postage. Or send **$2** now, and pay postman balance plus postage. Money back if not delighted after 5 days' trial.

DREMEL MANUFACTURING CO.
Dept. SA-128-F Racine, Wis.

EASY FOR AWKWARD PLACES

SANDS FLAT SURFACES EVENLY

GETS INTO TIGHT CORNERS

ROUNDS CORNERS LIKE MAGIC

Who Ever Heard of **POWER TOOLS**

Only $7.00 Each?

5 large capacity power tools in **one unit:** lathe, drill press, circular saw, grinder and sander. Uses ¼ h.p. motor. **Complete, only $34.95.** Does same work as equipment costing up to 8 times more. Send $17.50 (balance c.o.d.) on **10-day FREE trial, money-back guarantee.** Or write us today for FREE illustrated literature.

HEAVY DUTY HOME WORKSHOP

COMPLETE $34.95

EMRICK, INC., 1756 Clinton, Kalamazoo, Mich.

GIANT

Astronomical Telescope

100 diameters magnification. (10,000 area magnification) 3 inch diameter steel main tube 50 inches long. Brass focusing tube. Tripod 6 feet high. Equatorial mounting. Ready to set up and use. Full power and clear vision guaranteed. Price $15.00. 20% deposit on C.O.D. orders.

DEPT. BT, SUFFOLK SCIENCE SERVICE, MANORVILLE, N. Y.

"NO EXPORT ORDERS ACCEPTED"

CUBIC-INCHER **RADIO SET $2.39**

SIGNAL-POWERED
NO ELECTRICITY

Entire set less than one cubic inch in size, rests in bowl of teaspoon! Radar 1N34 detector, world's best for crystal sets. Works anywhere—never wears out—costs nothing to operate. Safe and foolproof. Reception is guaranteed. With connecting leads and complete directions. $2.39 postpaid without phone. $3.19 postpaid with phone. Foreign orders 10% extra, prepaid only.

CARING PRODUCTS Dept. S1, Box 1308 Chicago 90, Ill.

Announcing our Appointment

NATIONAL DISTRIBUTOR

Mustang **MOTORCYCLES**

TESTER'S ROAD REPORT
MAXIMUM SPEEDS IN

GEAR	RATIO	M.P.H.	R.P.M.
HIGH	4.48:1	65	4875
SECOND	7.25:1	50	5800
LOW	11.75:1	30	6100

SPEED AT END OF ¼-MILE STANDING START: 62 M.P.H. FUEL CONSUMPTION: 70 M.P.G.

WRITE FOR ILLUSTRATED BOOKLET

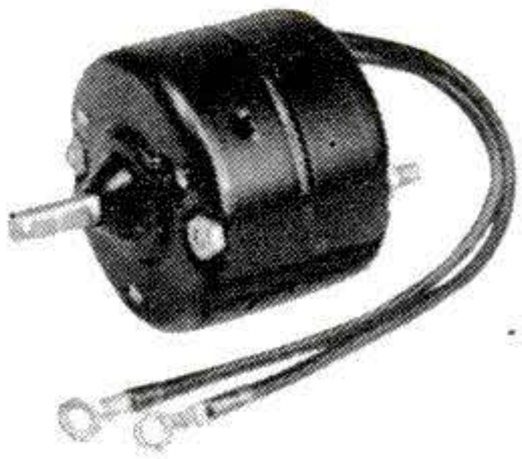
SALES TERRITORIES STILL AVAILABLE

Low cost . . . top performance . . . easy, safe operation . . . they're *yours* with the new Mustang, the cycle of a thousand uses!

JOHNSON MOTORS, INC. • 267 West Colorado St., Pasadena 1, Calif.

Copyrighted material

ELECTRIC MOTORS NEW-SURPLUS



1/28th H.P. 110 A C 60 CYCLE

2500 R.P.M. Minimum—2750 Max—Start 90 V. Runs Clockwise. 1¾" long by 2¾" wide ¼" shaft **$2.95**

1/8th H.P. 7500 R.P.M. Complete with gear assembly **$3.95**

24 VOLT MOTORS-AC-DC, BALL BEARING

1/10th H.P. 3600 R.P.M. $2.95 ea.

1/11th H.P. 3600 R.P.M. $2.95 ea.

3½ H.P. 24 V. DC only $2.95 ea.

SHUNT MOTOR 12V.-DC. Will run on 6V. 5600 R.P.M. Type B-9-2. 1.4 Amps. Each **$2.95**

All prices F.O.B. Detroit. Send cash or money order. Orders shipped by Railway Express.

RADIO CENTER
2530 E. DAVISON
DETROIT 12 MICH.

EXTRAORDINARY GOV'T RELEASE!

All-Purpose STIRRUP PUMP

Shoots a high pressure stream 30 feet!

PERFECT FOR
- Spraying Trees
- Whitewashing
- Firefighting
- Washing Cars
- Bailing Boats & Basements

COMPLETE with 10 ft. of flexible hose

Thousands sold at $3.80

NOW LOOK! only **$1.49** EACH

SATISFACTION GUARANTEED Or Your Money Back!

plus 25c for postage and handling.

MAIL THIS COUPON RIGHT NOW!

AMERICAN HANDICRAFTERS, INC. DEPT. PS6
2905 W. Madison St., Chicago

Send me.....All-Purpose STIRRUP PUMPS at $1.49 each plus 25c for postage and handling.
Enclosed find ☐ check ☐ money order.
☐ Send C.O.D. I will pay small C.O.D. charge.

Name.....

Address.....

City & State.....

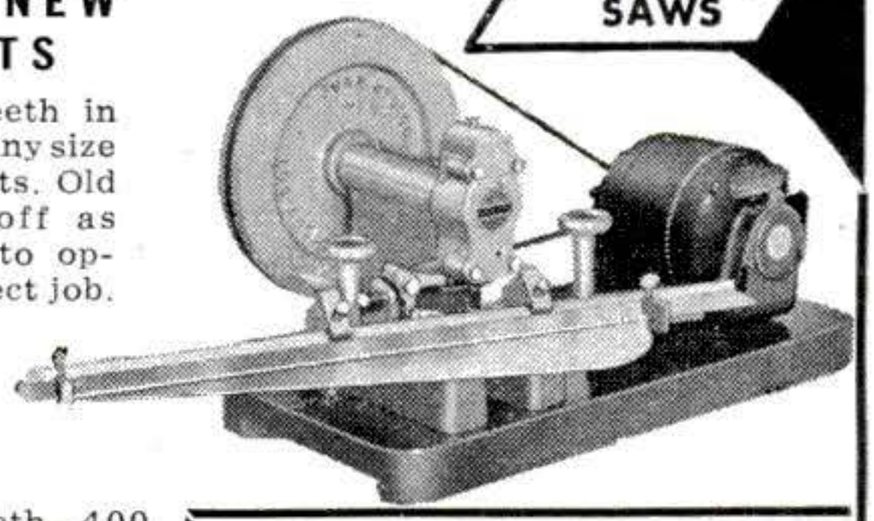
AMERICAN HANDICRAFTERS, INC.
2905 W. Madison St. • Chicago 12, Ill.

AUTOMATIC RETOOTHER

FOR HAND SAWS

MAKES NEW PROFITS

Cuts new teeth in 50 seconds! Any size 4 to 16 points. Old teeth fall off as chips. Easy to operate. A perfect job.



IMMEDIATE DELIVERY

Set saw teeth—400 per minute with new Automatic SAW SET. Perfect hammer and anvil action sets teeth uniformly. No tooth breakage.

VALUABLE BOOK
Order Burr's Blue Book of Coast to Coast Prices for Saw Shop Services. **25c**

BURR MFG. COMPANY 8943-T Venice Blvd. Los Angeles 34, Calif.

CARBURETOR TOO RICH

MAKES MOTORIST TOO POOR

Car owners who are wasting money and not getting proper gas mileage due to over-rich mixtures will be pleased to learn how to save gasoline by VACU-MATING over-rich mixtures. VACU-MATIC fits all cars, trucks and tractors. It is *automatic* and operates on the supercharge principle. Easily installed in a few minutes.

SALESMEN WANTED! Big Profits! Send name, address on penny postcard for *free particulars* and how to get yours for introducing.

VACU-MATIC CO., 7617-1336 W. State St., WAUWATOSA, WIS.

LITTLE MEN ONLY

Learn 29 effective blows directed against nerve centers of your assailant. No mat work—no gym work—no muscle building—no weight lifting, etc. • Send $1.00 for this valuable self-explanatory chart. **S. R. Linck & Associates,** 448 So. Hill St., 706 Pershing Sq. Bldg., Dept. PS-6, Los Angeles 13, Calif.

COMFORT SUMMER and WINTER

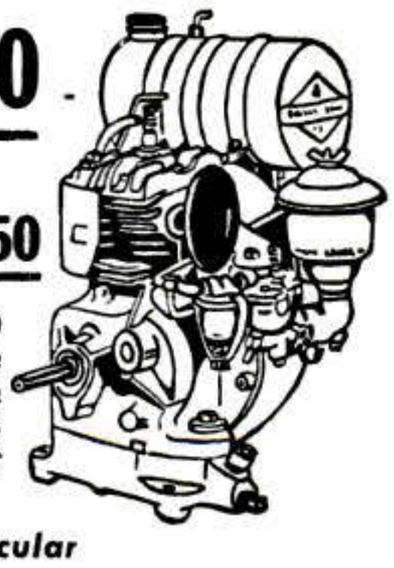
COOLERS. All kinds, all sizes, from the one room window type to the large coolers for homes, offices, clubs and stores. **BLOWERS**, motors, cooler pads, cooler pumps, attic fans, fan blades and coils. **FURNACES**: Gas & Oil furnaces and burners. Coal furnaces and stokers. Gas ranges, all sizes. Water heaters. Refrigerators. Write for literature. Lowest prices.

PEERLESS SALES & SUPPLY • *Wholesale & Retail*
4324 Sheridan Blvd., Lincoln 6, Nebraska

BRIGGS-STRATTON ENGINES

1½ Hp Model N—Govt. Surplus

Special Low "as is" price Only..... **$34.50**



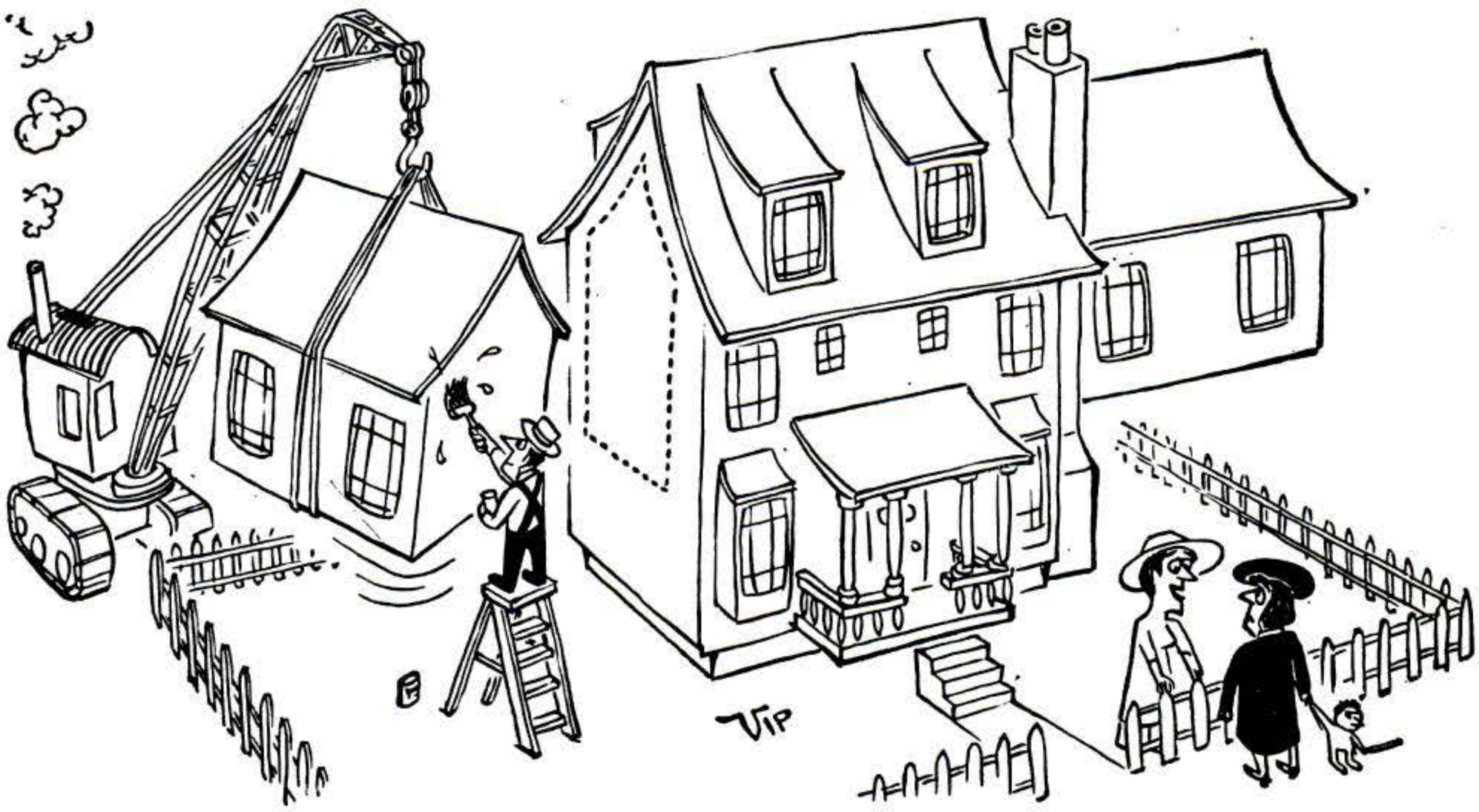
In good operating condition with 30 day written guarantee..... **$44.50**

Engines will develop almost 2 Hp at 3600 RPM. Hurry, don't wait, buy now while limited supply lasts. Suitable for lawn mowers, garden tractors, motor bicycles and scooters, midget cars, etc. Will power many kinds of machinery.

Write for Descriptive Circular

MIDWEST SURPLUS SALES CO. 2531 Indiana Kansas City, Mo.

Copyrighted material



"We needed some extra rooms in a hurry, so when we found out that Weldwood Glue is so strong . . ."

When you want a wood-to-wood bond that will really hold . . . remember Weldwood Glue. It's quick to mix . . . easy to use . . . tremendously strong . . . stain-free . . . rot-proof . . . and permanent. At hardware stores, lumber yards, chain stores, in 15¢ 35¢, 65¢, 95¢ and larger sizes.

WELDWOOD
PLASTIC RESIN GLUE

United States Plywood Corporation, New York 18, N. Y.

NEW SAW EASY HANDLING BIG POWER

New American Portable Electric Saw saves time, labor and money in *production work.* Not a hobby tool. One hand operation. Cuts any angle. 8" blade. Write . . give occupation.

AMERICAN
FLOOR SURFACING MACHINE COMPANY
532 So. St. Clair St. Toledo 3, Ohio

FOR RENT at **4¢ PER DAY**

WOULD YOU RISK 4c a day to be the well-paid Operator of 50 modern 5c Nut Vending Machines? Yes, 10 machines for less than a cent. Large Profits. Low Overhead.

CONTINENTAL CASHEW COMPANY
Box 767 Milwaukee 1, Wisconsin

★ WRIST WATCH
★ STOP WATCH
★ TELEMETER
★ TACHOMETER

Phenomenal Value!
17 JEWEL • 2 PUSH BUTTON
CHRONOGRAPH

ONLY $29.75 PLUS 10% TAX

INCABLOC SHOCK RESISTANT FEATURE
• Sweep Second Hand • Radium Dial • Anti-Magnetic • Unbreakable Crystal. (formerly $71.50)
IDEAL FOR
• Physicians • Engineers • Radio Men • Sportsmen • Photographers • Aviators

OUR GUARANTEE
MONEY BACK IN 10 DAYS
If not satisfied for any reason

ADLEW JEWELERS
117 W. 42nd St., N. Y. C. 18
Mail Orders Promptly Filled • Shipped C. O. D. or send check or money order.
Address mail-orders to: ADLEW JEWELERS (Dept. PS-6), 152 West 42nd St., N.Y.C. 18.

Also available in 18-k Gold Case. $64.50 (plus 10% tax), formerly $125.

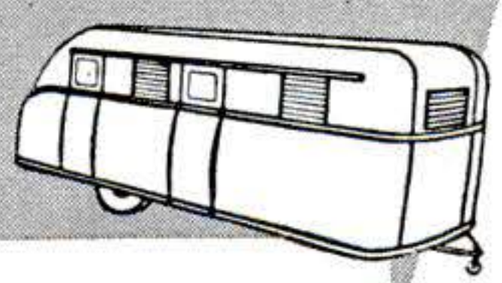
TINY RADIO FITS IN YOUR EAR!

ABOUT NICKEL SIZE! Wt. 1 oz! AMAZING TINY but contains CRYSTAL DIODE AND ALNICO PHONE. RECEIVES LOCAL RADIO BROADCASTS by simple connections. USE MOST ANYWHERE IN OFFICES, HOTELS, CABINS, SCHOOL, BED, etc. Should play for years.

SEND NO MONEY Just pay postman $2.99 plus COD postage on arrival. Order your ear-radio—Today—Now!

PAKETTE PRODUCTS CO., DEPT. EPS-6, KEARNEY, NEBRASKA

It's EASY! ECONOMICAL!



Build Your Own Trailer with NATIONAL'S Simplified Plans

Beat the housing shortage with a full-size house on wheels or add new pleasure to your vacations and week-ends with a sleek sport trailer. Step-by-step instructions and complete bill of materials with every plan. *Three different models.*

NATIONAL MODEL 27: A 27-ft. luxury liner with 3 rooms, lavatory, sleeping space for six. Plans $1.00

NATIONAL MODEL 20: A 20-ft. cabin trailer that's good-looking and sturdy, with beds for four. Plans $1.00

NATIONAL CAMPER: The sport trailer you've wanted for hunting, fishing, vacations Sleeps two Plans 50

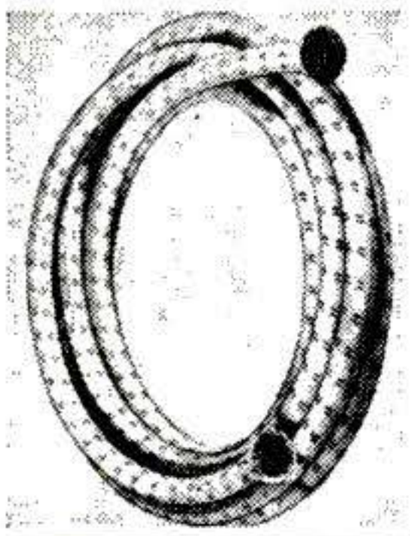
ORDER ALL THREE—AND GET ONE FREE
Complete set $2.00

Big parts catalog FREE with any order! FREE!

NATIONAL TRAILER STORES
Dept. 53 • Box 2353 Terminal Annex • Los Angeles 54, Calif.

Copyrighted material

WAR SURPLUS • SHOCK CORD



Made in accordance with U. S. Army Specification 20-23-G (Type 1) and U. S. Navy Specification 49 C 1. Clean fresh stock. 5/8" dia. contains about 500 strands of live rubber, 3/8" about 100 strands, 1/4" about 40 strands. Sold in lengths of 25 feet or more.

Dia.	Per ft.	Per 25 ft. length
1/4"	4c	$1.00
3/8"	5c	1.25
5/8"	7c	1.75

The 1/4" length is ideal for exercise cord in flexibility. The heavier lengths have a thousand uses.

PARACHUTES

HARNESS ONLY

SEAT PACK

Swell swing for youngsters. Complete with seat and back cushions **$1.75**

CHEST OR BACK PACK

Many feet of webbing, useful for tow rope, many clamps and buckles, each..... **$1.50**

HELMETS

Genuine African campaign sun helmets, light weight, durable, water repellent cloth, adjustable chin strap, sweat band stretches from size 6 3/8 to 7 7/8, each only.. **$1.95**

Send 25% Deposit on C.O.D. orders. Satisfaction Guaranteed or Money Refunded. Shipping charges extra. Rush your order today!—FREE! Write for Illustrated Circular.

U. A. S. Corp. Dept. PS3, 5643 W. 63rd Pl. Chicago, Illinois

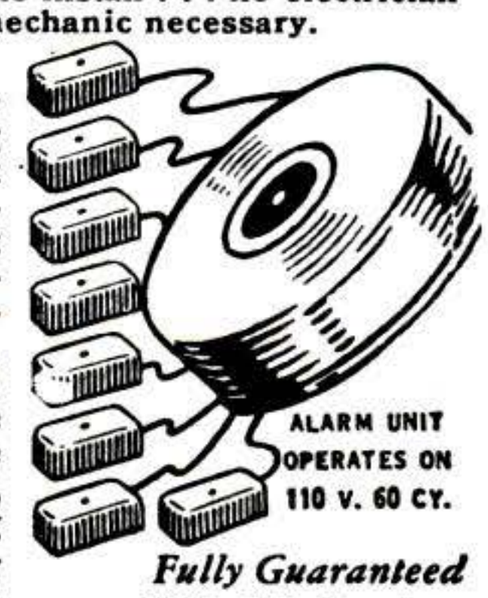
Fire Tattler SAVES SLEEPER'S LIFE!

Fire Tattler's piercing automobile-type horn arouses you from the soundest sleep soon enough to reach safety . . . soon enough to save your home and family.

Last year nearly 12,000 people were killed in the U. S. by fire . . . over 2,000 of these were children under five.

Now you can protect your loved ones . . . save your property with this inexpensive fire alarm system . . . and it is simple for you to install . . . no electrician or mechanic necessary.

●Hang attractive alarm like electric clock in any room, plug into nearest socket. Alarm unit (only 7" diameter) contains: relay, transformer, and compact automobile-type horn of precision build. Mount 8 fire detectors in home danger zones. Connect these in closed circuit to alarm with provided wire. Fire detectors contain replaceable units which melt before 170°F., breaking circuit and sounding alarm. Complete equipment includes: 250 ft. fine, insulated wire, screws and staples . . . nothing more to buy. For homes where there are danger areas of up to 2000 sq. ft. Circuit uses no more electricity than a large flashlight.



Fully Guaranteed

$24.75 Complete

PARCEL POST PREPAID ANYWHERE IN U.S.A.

Order Today! *Send check or money order...*

FIRE TATTLER

Ingersoll & Co.

302 N. Prior Ave. • St. Paul 4, Minn. • Dept. S-6

SAVE $64.00 AND UP!
Pneumatic Air Tools

Ideal fender and bumping hammers, and for riveting brake lining, concrete breaking and many other uses. Like new. At these unheard of low prices it pays to order a good supply.

RIVETER & CHIPPING HAMMER

Ingersoll-Rand AVC-11 with air control, push button throttle, takes up to 5/32 rivet. Like new. Weight 5 pounds. List Price $73.00—Special Price..... **$7.95**

RIVETER & CHIPPING HAMMER

Chicago pneumatic CP4 with air control, push button throttle, takes up to 3/16 rivet. Weight 6 lbs. List Price $73.00—Special Price..... **$8.95**

CHICAGO PNEUMATIC RIVETER & CHIPPING HAMMER

CP9X offset handle, with air control. Takes up to 1/4" rivet, weight 8 lbs. List Price $79.00. Special Price **$10.95**

THOR PNEUMATIC ALLIGATOR

Squeezer and Compression Riveter

Model PRS-10, Alligator jaws, or PRS-10, "C" Type Yoke. Weight 5 lbs. List Price $93.00 — Special Price **$12.95**

PRICES ARE F.O.B. CHICAGO. Immediate delivery. SOLD ON MONEY BACK GUARANTEE. Send check or money order today.

C & M EQUIPMENT COMPANY 1831 S. State St., Dept. B-6, Chicago 16, Ill.

---

60 POWER TELESCOPE $2.95

VARIABLE EYEPIECE 20X-40X-60X

NEW! Three telescopes in one, 3 different magnifications. 20 power for ultra-bright images with 40 and 60 power for extra long range. Guaranteed to bring distant objects, people, sports events, ships, moon, stars, etc., 60 times as close.

Most powerful for anywhere near the money. 5 sections. Closes to 1 ft. long. Contains 4 ground and polished lenses. Also used as a powerful compound microscope. Directions included. Mass production enables us to offer this high-powered instrument at the amazing price of only $2.95. We pay the postage. Get yours immediately.

BROWNSCOPE CO. Dept. 6P 24 West 45 St. New York 19, N. Y.

BAR BELLS

Buy Direct From Factory
Save 20% to 30%
Write for Free Booklet and Price List

$8.95 up

INDEPENDENT IRON WORKS
2416 EAST 23RD STREET, DEPT. C
LOS ANGELES, CALIFORNIA

MARK GOLF BALLS...EASILY

"Ballmark" stamps your name into golf balls. Avoid mix-ups. Lost balls returned to you. Nationally famous, durable, colorful plastic with metal type. NEW DE LUXE KIT, includes *extra bottle of ink. An unusual gift,* complete with any name. Order today from us or your dealer..... **2.50**

HOLIDAY PRODUCTS CO., DAYTON 1, OHIO

EYE GLASSES BY MAIL

INCLUDED: Eye Glass Case, Wiper, Eye Glass Cleaner with each order! **30-DAY TRIAL OFFER. NEWEST STYLES. POSITIVE MONEY-BACK GUARANTEE.** Write today for **FREE** Catalog, Low Prices, Scientific Sight Test Chart!

Broken Lenses Replaced — 48-Hr. Service.

LOW AS $1.95 AND UP

LEE EYE GLASSES CO., Dept. Q-8
4148 Easton - St. Louis 13, Mo.

SEND NO MONEY

Copyrighted material

THE WORLD'S FINEST SURPLUS BARGAINS

NOTE: These glasses are surplus property of U. S. Air Forces.

BRAND NEW! AIR FORCE

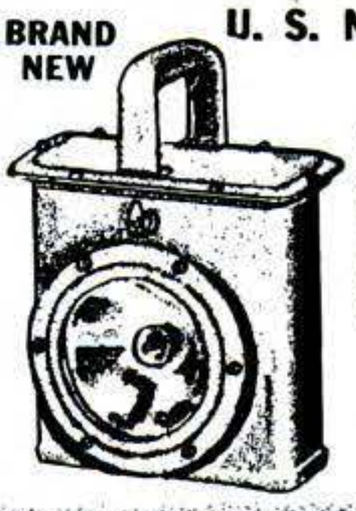
Genuine SUN GLASSES

Spec. No. AN-6531 (none genuine without this spec. no.). 6 base lenses precision ground by Fischer, Bausch & Lomb and American Optical. $10.00 value. Complete with case. prepaid **$4.95**

Air Force "Type" Sun Glasses **$1.98**

BRAND NEW

U. S. NAVY LANTERN



Delta Extra Heavy Duty

Water-tight, practically indestructable. Uses 2 standard No. 6 dry cells. 800 ft. beam. Bulbs included. Wt. 6 lbs. $8.00 value. **$3.95** less batteries

G. I. "Coleman" STOVE

Brand new. Lights instantly burns white or leaded gasoline. Handiest stove made. $10.95 value. **$7.95** Wt. 4 lbs.

A-2 AIR FORCE TENTS

Light weight waterproof nylon. Zippered side door and window. Rubberized floor. Aluminum poles and stakes. Insect screen. Sleeps 1 or 2. Carrying straps included. Compact. Wt. 21 lbs. Govt. cost $30.00 **$9.95**

Genuine B-7 GOGGLES

BRAND NEW

Brand New. Air force flying goggles. Metal frames, rubber face piece, adj. nose pc. Precision ground lenses. Government cost $7.20. **$1.98**

U. S. ARMY COTS

Re-issue. Guaranteed perfect! Extra sturdy. Heavy canvas covers, hardwood frames. Holds 1,000 lbs. **$3.75** Wt. 25 lbs. Shipped frt. collect. Brand new cots (as above) **$4.95**

C-2 AIR FORCE RAFT! NEW!

SAFE!

Holds 1 or 2. Complete! Mast, sail, pump, paddles, anchor, etc. Compact, safe. Wt. 19 lbs. Govt. cost $125. **$19.75**

PK-1 Raft (as illustrated). New. without sail, etc. **$14.95**

5 Man Raft. Opens 5x9 ft. Complete with sail and accessories. Wt. 60 lbs. **$34.95**

NYLON-JUNGLE HAMMOCKS

Brand new hammocks. Insect proof, rot proof, zippered. Complete with ropes and canopy, hanging rings, etc. Wt. 9 lbs. Govt. cost $14.00. Only **$4.88**

Genuine M-6 COMPASS

Precision compass by "Sherrill" Easy to compensate, equipped with nite lite, excellent for planes, cars, boats, trucks, etc. Easily mounted. Instruction manual and calculator included. $25.00 value. **$5.95** prepaid

Mail orders add 10% unless otherwise stated.

FISLER SALES CO. 721 Walnut Kansas City 6, Mo. **FREE CATALOG** Illustrated! Showing hundreds of other surplus bargains! Write for PS-3A catalog today!

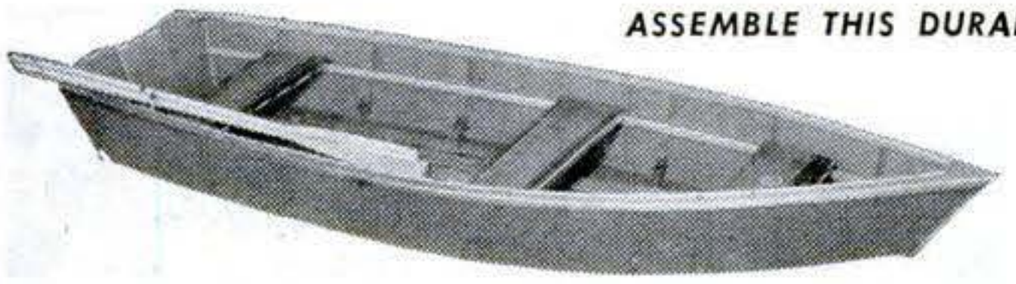
Go Fishin- in Your Own Boat

Complete, Ready-Cut

PLYWOOD BOAT KIT $54

(Freight Paid)

ASSEMBLE THIS DURABLE, WELL-DESIGNED 12 FT. BOAT



in 8 hours without forms or special tools. Kit includes all hardware, paint. (Less oars.) *Send for Free Folder.*

LIGHTWEIGHT • MARINE PLYWOOD

TAFT MARINE WOODCRAFT
Dept. L—636 39th Ave. N.E.
Minneapolis 18 Minnesota

U. S. ARMY FRENCH TYPE TELEPHONES

NOT A TOY

The most sensational 2-way indoor-outdoor telephone system. Sturdily constructed, amazing performance. Easy to install, just hook up with 2 strand wire supplied. Hook up several phones to one line if you wish. Supplied with 2 flashlight batteries and 2 rolls of new army field wire.

We will include not one but two sets of telephones with two rolls of wire complete with push button and buzzer for signaling all for the price of . . . . . **$9.95** F.O.B. N.Y.C.

SEND CHECK OR MONEY ORDER

NOT-1 BUT-2 Complete Sets

REMEMBER this equipment cost many times the price you are paying.

MANUEL KLEIN 72 Cortlandt St., N. Y. 7, N. Y.

POCKET OR PURSE SIZE RADIO!

SMALL AS A PACKAGE OF CIGARETTES Wt. only 4 oz.—**BEAUTIFULLY** molded silver black case. **NO TUBES—BATTERIES OR ELECTRIC "PLUG-INS" NEEDED!** Uses **NEW Type** fixed power crystal diode. ONE YEAR SERVICE GUARANTEE.

GUARANTEED TO WORK on local stations if used as directed. **Listen at home, in cabins, in bed, on farms, hotels, offices—most anywhere.** L. S. of Texas says "It's Wonderful".

SEND ONLY $1.00 (bill, money order, check) and pay postman $2.99 plus C.O.D. fees on arrival or send ONLY $3.99 for postpaid delivery. **Complete—Ready to play! Marvelous gift for children or grownups; Bargain priced! Order your Pakette Radio now!** (Foreign $5.00 U. S. Cash).

PAKETTE RADIO COMPANY, INC., Dept PPS-6, Kearney, Nebr.

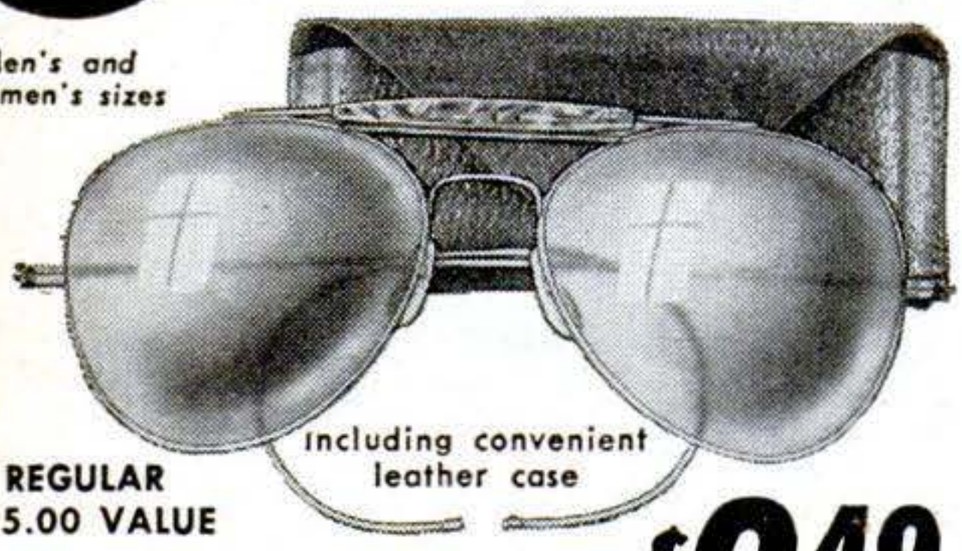
Copyrighted material

BEST BUY UNDER THE SUN!

U. S. ARMY AIR FORCE TYPE

SUN GLASSES

Men's and Women's sizes



including convenient leather case

REGULAR $15.00 VALUE

Super-Sensationally Priced at only..... **$2.49** postpaid.

- ★ Ground and polished 4 base lenses.
- ★ Gold plated adjustable frames.
- ★ Pearloid sweatband and pads.
- ★ Made to highest optical standards.
- ★ U. S. Gov't. approved for absorption of ultra-violet and infra-red rays.

LIFETIME GUARANTEE At any time during life of these sun glasses, we will fix them for a nominal service charge of 50c.

MAIL THIS COUPON TODAY!

AMERICAN HANDICRAFTERS, Dept. PS6
2905 W. Madison St., Chicago 12, Ill.

Please send me.....men's.....women's SUN GLASSES

☐ Send C.O.D.
☐ Enclosed find check or money order for $2.49 each. postpaid.

Name.....

Address.....

City & State.....

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

MOTORS-PLANES-CARS-BOATS-MODELS

400 Pictures — 2,000 Model Items

A bible for wide-awake modelers. Model gas engines, planes, boats, cars, rubber-powered planes, jet models, accessories, etc., PLUS articles and stories on building and flying. Send only 10¢, stamps or coins. Also free catalog available.

SPECIAL: U-Control or Free Flight Flying Outfit, complete with motor, plane and over 30 needed accessories.

Only $10 COMPLETE

1/6th h.p. Engines: Thor $9.95; Genie $6.95; Judco $7.25

AMERICA'S HOBBY CENTER, INC. DEPT. S-68 156 WEST 22 ST., N. Y. 11

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Sensational SHAPER CUTTER

For Endless Molding Contour Designs

Employs exclusive double notched sets of full 1" and ½" split blades. Blades automatically held in position by notched design and in absolute alignment. No set screws to loosen; blades cannot fly out. Provides endless varities of standard and special contours. Specify type of spindle on drill press or shaper. Available in six standard adapter sizes. Ten-day money back guarantee. Complete literature on request.

$9.00 Complete with 3 sets of Hi-speed Tool Steel Cutters

TOOLS FOR USE ON ALL DRILL PRESSES

ROTARY WOOD PLANERS — ROTARY SURFACE SANDERS
ALL-METAL SHAPER FENCES — DRUM SANDERS
SPINDLE ADAPTERS — AUXILIARY DRILL PRESS TABLES

BARRON TOOL COMPANY, INC,
270 Architects Bldg.: Detroit 1, Mich.

FREE Power Tool CATALOG

BARRON PRECISION WORK SHOP **TOOLS**

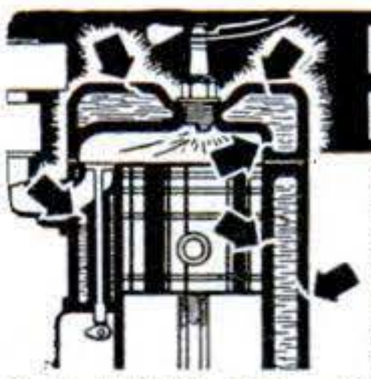
RARE BARGAIN SLIDE VIEWER

for 2x2 slides

Was $8.95
Now only
$3.49
plus 30c for postage & handling. No C.O.D.'s.

Now! A precision LaSalle Viewer at a price you can't afford to miss! The exact viewer that's a best seller in stores coast to coast at $8.95. Many high quality precision features. Perfect over-all illumination. Tilt regulator for greater viewing comfort. Self contained batteries. Beautiful, black, long life plastic case with silvery, smart contrasting trim. Complete with bulb and batteries at a price so low we're forced to charge for postage and handling.

Buy with confidence at
HABER & FINK inc.
Dept. P 12 Warren St. New York 7, N.Y.

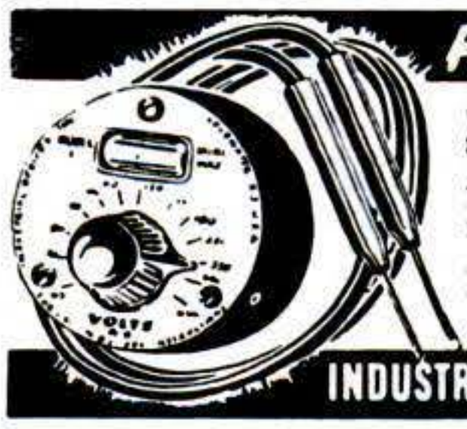


REPAIR CRACKED BLOCKS AND HEADS-

External and internal leaks in blocks, cylinders and valve ports quickly and easily with LUSCO PLASTIC SEAL.
90 day Service Guaranteed or your money back. Send money order or check for full pint—more than sufficient for average repair.. **$3.00** Postpaid

C. F LUSK CO., 5916 Bonna Ave., Cleveland 3, Ohio

FLASH THAT VOLTAGE



Turn that knob. Extinguish the neon glow. Instantly read voltage off dial. MINI-VOLT model 400B measures 65 to 660 V. AC. Also DC. Tells AC or DC. Virtually burn-out proof. Guaranteed for 10,000 hours. 12" test leads. A "must" in electrical and radio work. At dealers or postpaid $2.50. (C.O.D. 25c extra.)

INDUSTRIAL DEVICES, INC., EDGEWATER 2, N.J.

PULVEX FLEA POWDER

TWO KINDS

WITH 5% DDT
. . . for dogs. Kills fleas and lice quick. Keeps fleas off 5-7 days. Many home uses.

OR WITH ROTENONE
. . . for cats, dogs. Quickly kills fleas, lice. Kills fleas when put on a single spot. Pre-war formula.

EITHER KIND: 25c & 50c

REPLACEMENT OR REFUND OF MONEY — Guaranteed by Good Housekeeping — IF NOT AS ADVERTISED THEREIN

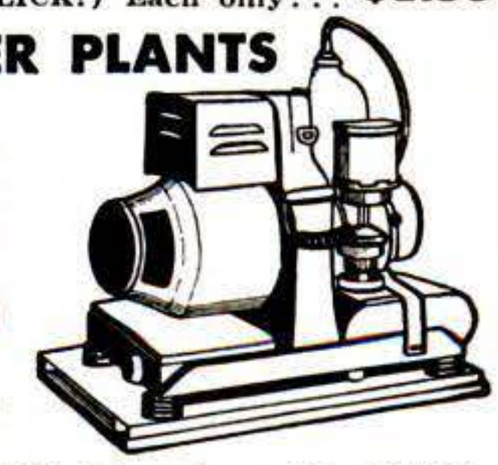
U.S. SURPLUS BARGAINS!

• DUMMY TRAINING RIFLE

Authentic, raised sight-ADJ for range, carrying strap, bolt action, (CLICK!) Each only... **$1.50**

• AUXILIARY POWER PLANTS

Government Cost $295
Complete. Our price "as is"— **$40**
Description available



• SOLID RUBBER WHEELS

1-10 Inches, 35c per lb.

Catalogue Available. No C.O.D.'s —Shipments by Railway Express.

N. Y. SALVAGE 144 Chambers St. N.Y.C.

Copyrighted material

Ball-Bearing SPEED WHEELS

Juvenile wheels, solid tire—No Bearings

7" wheels.....60c
6" wheels.....50c
4" wheels.....30c

Semi-pneumatic tired wheels

12 x 1.75".....$3.25
10 x 1.75".....$2.75
10 x 1.25".....$2.00
8 x 2".....$2.00

Industrial wheels for heavy loads
Semi-Pneumatic

400 x 8. 2 ply tire and tube $12.50
10 x 2.75" Hollow Core.....$6.75
10 x 2.75" Single Tube.....$7.25
12 x 3.00 wheel bolted hub $9.75
8 x 2.50".....$4.90
6 x 2" spot welded.....$2.80
6 x 2" lug base @.....$3.30

Dealers and Manufacturers inquiries invited

Free blueprints with all wheel orders.
Send check with order. Shipments f.o.b. Akron.

JIM BROWN TOY COMPANY
1093 Home Ave. Akron 10, Ohio

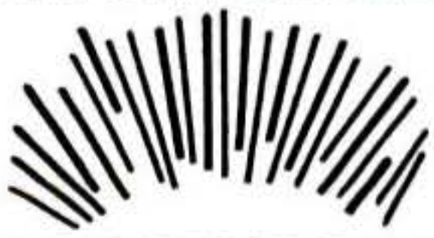
ASSEMBLE THIS BEAUTIFUL COLONIAL POST LAMP

• These new kits bring the popular colonial lamp within reach of all craftsmen. Complete instructions furnished. all parts correctly sized and formed. 16" high, 10" square, 3" post diam.
Kit No. 1. You solder frame. . **$7.95** ea.
Kit No. 2. Frame ready-welded, you complete job with screwdriver. . . . **$9.95** each
black, ready to install, less bulb. . . **$14.9**
Complete Lamp is shown, finished in dull black, ready to install, less bulb. . . **$14.95**
We pay postage, money-back guarantee. Send check or money order, or ask for **free literature.**

LORENZEN INDUSTRIES
Dept. PS-6 Niles, Mich.

WAR SURPLUS!

HIGH SPEED DRILL BITS



LIKE NEW! Original value over $16 00. 25 assorted sizes and lengths **$2.50**

Send check, money order or cash
Shipped F O B Culver City. Weight 1 Lb.

AIRBORNE SALES CO. INC. DEPT PSM-6-8 CULVER CITY, CALIF.

NEW B-M POWER MOWERS

AT LOW FACTORY COST

For Modern Lawn Care. Newest model self-drive, three-wheel, rotary blade mower. Equipped with quick-starting, dependable, trouble-free 1½-2 h.p. Clinton engine. Light. Sturdy. Choose from three models of assembled mowers or Build-it-yourself kit of parts. **Guaranteed.** FREE literature.

B-M MOWER COMPANY
Box 66-S Blue Mound, Kansas

You Can Convert DRILL PRESS To SURFACE GRINDER In Seconds!

Exclusive Feature:
ANCHOR SAFETY GUARD!

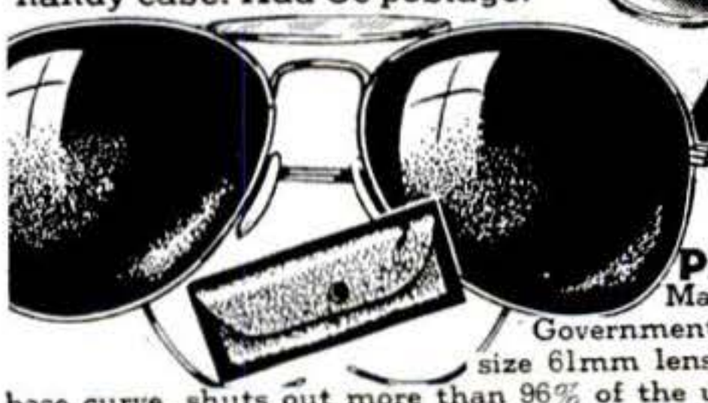
Now you can utilize your drill press to become a power surface grinder, and can convert in a jiffy with ANCHOR SURFACE GRINDING ATTACHMENT. Add that professional finishing touch to flat plates; sharpen cutting tools to exact angle; use for general off-hand grinding; many other practical uses! Our safety guard (patent pending) remains stationary while wheel revolves. This eliminates damaging vibration; makes possible downward feed operation; provides numerous other distinct advantages! ANCHOR ATTACHMENT uses standard 4"x3"x½" Arbor Hole Cup Grinding Wheel, available at supply stores or from us; has hardened, ground shaft; OILITE bearing; ESNA locknut; aluminum housing; large oil reservoir (months supply); attractive oil resistant finish. **Satisfaction guaranteed.** Sent postpaid (USA only). **$10.75**
Sorry, no c.o.d.'s.

Anchor Mfg. & Sales, Box 3164, Tulsa 8, Okla.

WAR Surplus AND OTHER BARGAINS!

U.S. Navy SUN GLASSES 66¢

New. Genuine Navy issue. Polished and ground lenses. Plastic natural color frames, wire core. Complete with handy case. Add 5c postage.



AVIATORS Style 24K GOLD PLATED RIMS **2.88**

Made according to Government standard. Full size 61mm lenses, ophthalmic ground 4-base curve, shuts out more than 96% of the ultra-violet rays. Adj. nose piece, pearl sweatband, 24k g.p. rims. **Handsome leatherette case. Add 8c** postage.

SPECIALS

DOWN & FEATHER SLEEPING BAGS 13.99

Brand new. Full size. Complete in one piece. Water repellant poplin outside, down and chicken feather filled. Zipper opening. Weighs only 7½ lbs. Add 40c postage.

NAVY STYLE WHITE T-SHIRTS 69¢

New. Fine combed cotton yarn. Sizes small, medium, and large. Add 3c postage

O. D. WOOL PANTS 2.95

Used, perfect. 100% all wool serge. Cleaned and pressed by the Q. M. Corps. Add 12c postage.

O. D. WOOL SHIRTS 2.69

USED - PERFECT
SIZES - 13 to 15

59¢

Gen. NYLON PARACHUTE CORD

50 ft. long, 3/16" diameter. White and olive drab. Ideal for clotheslines, drapery and venetian blind cords, etc. 550 lb. tensile strength. Add 6c postage.

Surplus DUST MASKS 33¢

Brand new. For paint or insect spraying. For millers and farmers. Perfect dust protection. Add 5c postage.

GREATEST WATCH VALUE in the U.S.A!

17 JEWEL NOW ONLY 19.95

PLUS 10% FED TAX

Think of it! Here is a genuine 17-jewel wrist watch with a GUARANTEED SWISS MOVEMENT. WATER & DUST REPELLANT, SHOCK-PROOF, ANTI-MAGNETIC, RADIUM DIAL and SWEEP SECOND HAND. Set in a genuine stainless steel case with a fine leather strap. Save at least $15.00. If you don't think this the greatest value in the U.S., return it for refund.

Khaki SUN TAN SHIRTS BRAND NEW
14 to 17
2.99

PANTS
28 to 42
3.79

Brand new. Pants made of 8 oz. and shirts of 6 oz. mercerized khaki suntan twill materials. Well tailored. Add 5c per garment postage.

MAIL ORDERS

Please send remittance with order. Include postage. Order will be sent C.O.D. plus C.O.D. fee. Satisfaction or your money back.

Send for FREE SURPLUS CIRCULAR

This circular lists and illustrates OVER 150 WAR SURPLUS **BARGAINS, also many other startling values.**

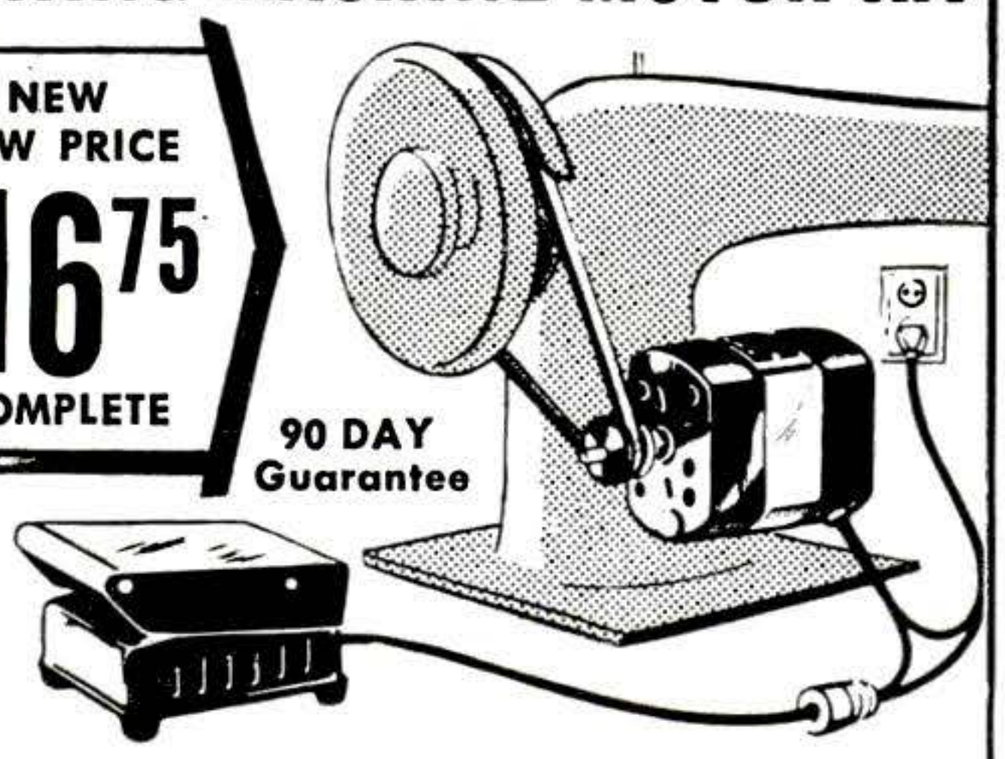
SIOUX FALLS SURPLUS STORE
SIOUX FALLS, S. DAK.

Copyrighted material

ELECTRIFY Your Sewing Machine with a SEWING MACHINE MOTOR KIT

NEW LOW PRICE **$16.75** COMPLETE

90 DAY Guarantee



ANYONE CAN INSTALL IT . . . QUICKLY!
FITS ANY TYPE OF SEWING MACHINE!
Convert your *old* sewing machine into a *modern electric* sewing machine . . . at a fraction of the cost of a *new* machine.

• **COMPLETE SET CONSISTS OF:** MOTOR — fan-cooled, Universal AC or DC, 60 cycles, 115 volts. BELT — Long wearing rubber • PULLEY — Single grooved, steel hubbed • FOOT CONTROL — New sturdy 7 step rheostat • CORD SET — Extension cord with plug and socket • BRACKET — New improved mounting bracket to fit *your* type of machine • Complete instruction sheet.

FULL SATISFACTION OR MONEY BACK!

BROWNELL DISTRIBUTORS, INC.
308 Canal St., New York 13, N. Y.

Please rush your kit at $16.75. The make of my machine is ..... Handwheel turns: ☐ towards me ☐ away from me.

NAME.....

ADDRESS.....

CITY.....ZONE.....STATE.....

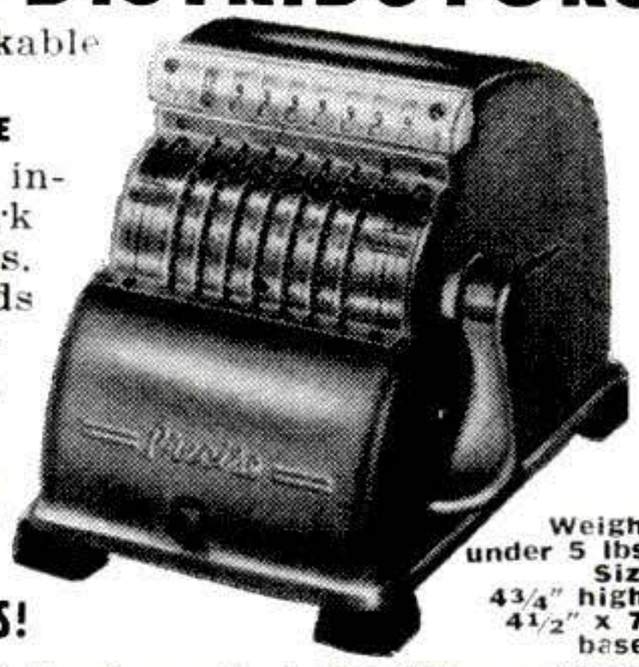
To save postage and C.O.D. charges, I am enclosing $16.75 ☐, check ☐, money order ☐. Send C.O.D. I'll pay postman $16.75 plus C.O.D fees

AGENTS — DISTRIBUTORS

To sell the remarkable **PRECISE "400" ADDING MACHINE** to stores, offices and individuals. Does work of $100.00 machines. Stylus operated. Adds and subtracts automatically. 7 columns.

LIFETIME GUARANTEE

Sells for only $19.95. You earn up to $10.00 on every machine.



Weighs under 5 lbs. Size 4¾" high, 4½" x 7" base.

WRITE FOR DETAILS!

E.C.A. MFG. CO., 2518 W. Montrose, Dept. P-6, Chicago 18, Ill.

WAR SURPLUS PHOTO PAPERS & FILMS

HEAR THIS!
CLOSE OUT SPECIAL

All 1946-47 dating. Tropical overseas packing. Guaranteed to be as good as the day manufactured. Sold strictly on a money back guarantee basis.

4x5 E.K. Aero Contact S.W. Contr. 1 & 2
Minimum 3 gross ..... gross **47c**
10 gross lots ..... gross **35c**
7"x125' E.K. Aero enlarging S.W. semi-gloss
Contr. 1-2-3-4 ..... roll **$1.25**
9 3/8"x200' E.K. Aero enlarging S.W. semi-gloss
Contr. 1-2-3-4 ..... roll **1.95**
9 3/8"x200' Defender Velour Black enlarging semi-matte
Contr. 2-3-4 ..... roll **2.50**

Send check, money order or cash. 25% Deposit required on C.O.D. orders. All prices F.O.B. Culver City, Calif.

AIRBORNE SALES CO., INC. DEPT. PSM 6-8 CULVER CITY, CALIF.

HOTTER GAS TORCH

100% PRIMARY AIR KELLER GAS TORCH
Burns Regular House Gas (Natural Gas Only) — No Compressed Air, No adjusting Needed — Develops 2100 F.
$3.45 Postpaid

Guaranteed to silver solder, light brazes, solders, removes paint rapidly. Precision-engineered. 1500 B.T.U. per hour.

Order today C.O.D. from
KELLER GAS APPLIANCES
P. O Box 261 Monrovia, California

MORE POWER FROM YOUR ENGINE WITH PERFECT TIMING

Keep the timing of your car, motorcycle, outboard or boat engine, tractor or any gasoline engine "right on the nose" with this amazing new TIMERLIGHT. Easy to use. Attach one clip to engine block, the other to spark plug wire. Flash shows timing. A must for motorists, boat owners, farmers, mechanics. Nothing else like it. Send for yours NOW. Money back guarantee.

DEALERS: Good territory open. Write for details.

CONNIE BERT CO., 8115 Clinton Road, Cleveland 9, Ohio

Send No Money Write for free catalog

Simple Scientific method Money Back Guarantee

SELF-SERVICE OPTICAL CO., Dept. W2,
30 Journal Square Jersey City, N. J.

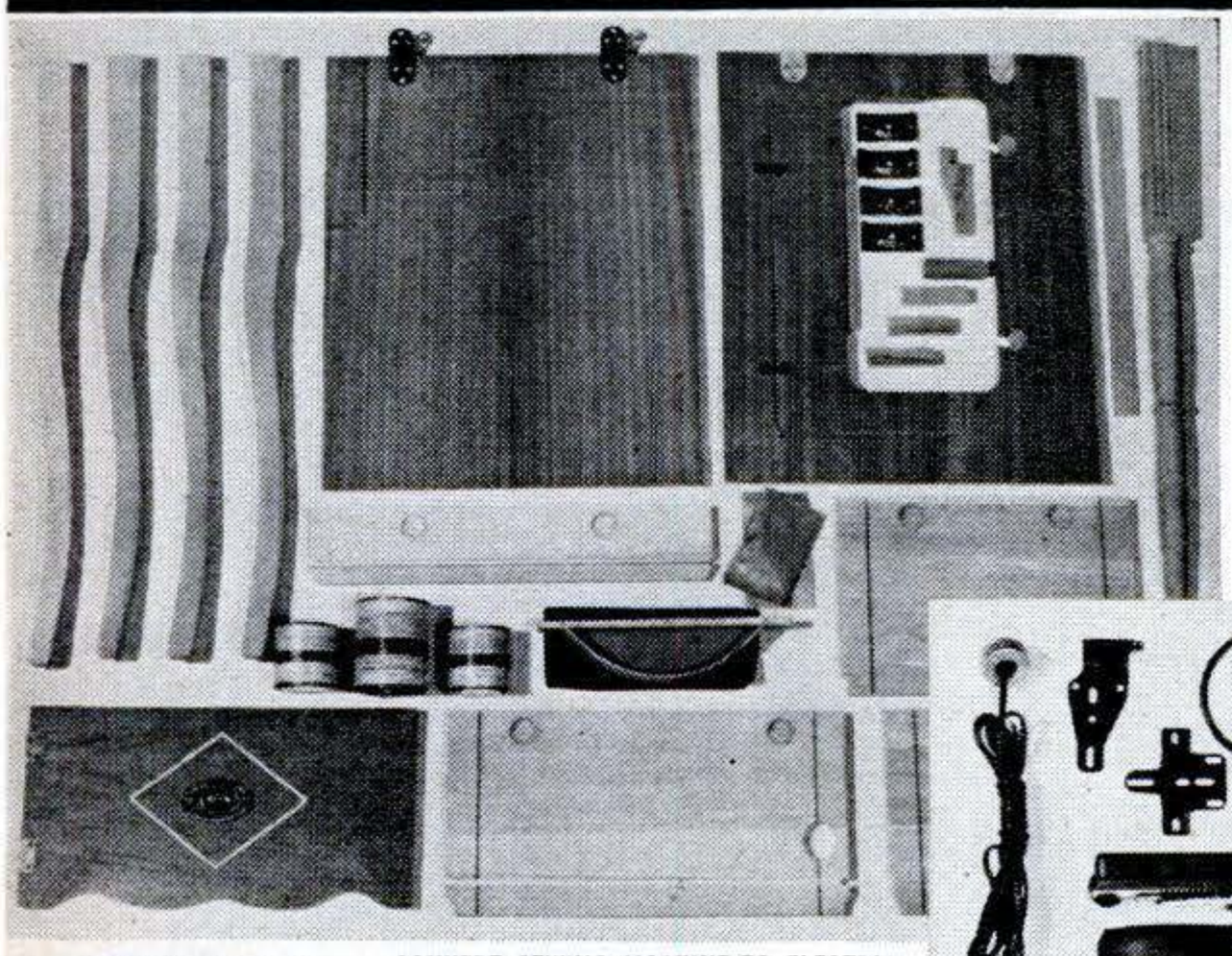
When PRAYER FAILS

The prayers of the most worthy people often fail. Why? The unworthy often have the greatest health, success, riches and happiness. The best, smartest, and most industrious people often have only pain, poverty and sorrow. Why? Thirty years ago, in Forbidden Tibet, behind the highest mountains in the world, a young Englishman found the answers to these questions. His eyes were opened by the strangest mystic he met during his twenty-one years of travels in the Far East. Sick then, he regained health. Poor then, he acquired wealth and world-wide professional honors. He wants to tell the whole world what he learned, and offers to send a 9,000-word treatise, FREE, to everyone who asks promptly. It is a first step to the POWER that KNOWLEDGE gives. There is no obligation. Write for YOUR FREE COPY today.

INSTITUTE of MENTALPHYSICS, Dept. 276-G
213 South Hobart Blvd., Los Angeles 4, Calif.

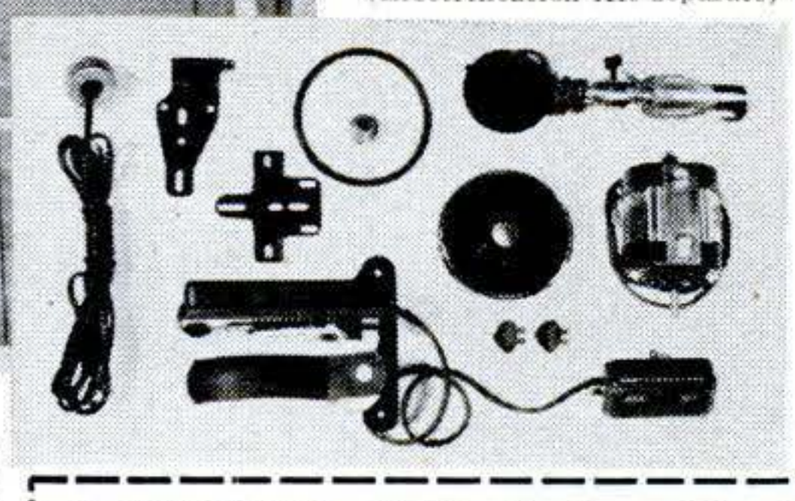
Copyrighted material

New! BUILD YOUR OWN *complete* ELECTRIC SEWING MACHINE!



YOU get everything—YES EVERYTHING—you need! Surprise your wife or mother by transforming her backbreaking treadle machine into a beautiful, modern, easy stitching ELECTRIC MACHINE that will fit in with the finest furniture. In addition you may save up to $125.00 over a new machine! This is not a flimsy kit. It is crammed full of exciting beautifully grained genuine walnut or mahogany lumber core stock and fine selected kiln dried hardwoods all shaped, presanded, drilled, and morticed and tenoned where needed. Difficult bed cut is all done for you ready to drop your present machine in place! Included also is all hardware, hinges, brackets, screws, stain, filler, varnish, full instructions, etc. A total of 103 separate items! All you need to assemble this fine console cabinet is a screwdriver, hammer, and paintbrush. Simple—yet just as much fun to build for novice and expert alike. MONEY BACK IF NOT FULLY SATISFIED.

Complete Console Cabinet Kit..... $32.50
(Electrification Kit separate)



Announcement

This sewing machine kit is but the first in a series of completely new and challenging projects for Hobbyists. In the future, the CRAFTSMAN'S GUILD will bring you other hard-to-get items. By sending us your name and address now you will be placed on our mailing list and receive advance news of all these exciting projects plus price list of special woodworker's items. There is no obligation to buy—so send us your name today!

CONVERT SEWING MACHINE TO ELECTRIC

Any manually operated sewing machine can be converted to a modern electric machine. Easy-to-follow instructions make it simple. Compare part for part with any other kit offered. Save with CRAFTSMAN'S GUILD! Used with Console Cabinet Kit or separately.

THIS IS WHAT YOU GET: See Photo at Right—*Top Row* ● Extension Cord with Plug and *Double Socket* ● Brackets ● Rubber Belt ● Steel Pulley ● *Spotlight with Reflector.*

Bottom Row ● 7 Step Rheostat Foot or Knee Control ● Flywheel (Singer only) ● Universal AC or DC, 60 Cycle Motor ● 2 Male Plugs.

Complete Electrification Unit only $17.95

CRAFTSMAN'S GUILD, Marlboro, New Jersey

CRAFTSMAN'S GUILD, Marlboro, New Jersey PS-6

Please send me:
- ☐ Complete Kit at ..... $49.50 (Cabinet & Electrification Kits)
- ☐ Cabinet Kit Only at $32.50
- ☐ Electrification Unit Only at $17.95

State make of your sewing machine _____

Check Choice of Legs for Cabinet ☐ Queen Anne—Upper Left of Photo ☐ Turned—Upper Right of Photo

Check Choice of Wood— ☐ Walnut ☐ Mahogany

Send 10% with order, balance C.O.D. plus postage—or Cash and postage prepaid. West of Mississippi add $1.00.

NAME _____

ADDRESS _____

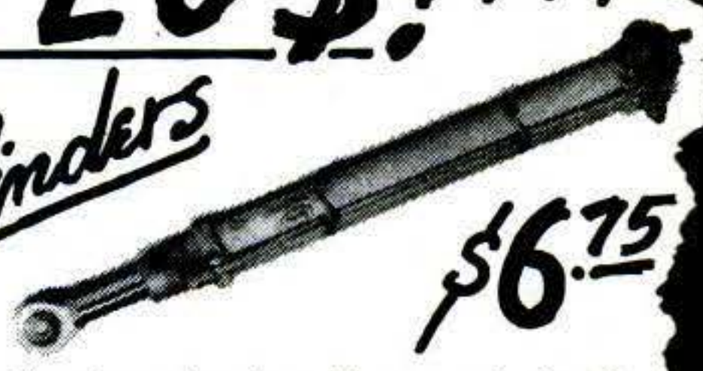
CITY _____ ZONE _____ STATE _____

$$$ $AVE ON $URPLU$! $$$

"The Gadget of the Month," Mark-18 Gyro Sight $6.95

The gadgeteers best buy. A truly amazing instrument, and best of all they are brand new in original cartons. Each unit contains a small gyro, a fine optical quality mirror and two superb achromat lens. Besides these, the sight comes equipped with a poloroid filter, a humidity indicator and six additional control units. This is really the bargain of the month.
(Shipped Express - Charges Collect)

Cylinders $6.75



A sensational surplus buy. Two-way hydraulic cylinder, will stand up to 1500 lb. pressure. Overall length 31", with a 2" bore and 18" stroke. The piston rod is 1¼" in diameter and has a bearing type rod end with ⅝" diameter hole. These cylinders have a swivel type mount, and are equipped with neoprene seals so that they will operate on any mineral base oil.

(SHIPPED EXPRESS - CHARGES COLLECT)

NAVY SUN GLASSES $1.25

Brand new Surplus Navy Sun glasses. Large curved lens, ground and polished, mounted in beautiful plastic frames. Stylish, practical, complete with sturdy convenient cases. (Add 20c to cover postage and handling.)

Steel Oxygen Tanks

These tanks are approximately 44" long by 6" in diameter. They will stand up to 400 lbs. pressure, and have an outlet on either end threaded with standard ¼" pipe thread. A real buy at only $1.50. (Shipped Express Charges Collect.)

All merchandise subject to prior sale, minimum order $2.00, No C.O.D. orders accepted. Michigan residents must add 3% State sales tax.

Due to customs regulations which require excessive paperwork and packaging complications, we cannot accept orders for shipment outside the United States or its possessions.

N. SILVERSTINE CO.
6532 EAST McNICHOLS ROAD DETROIT 12, MICHIGAN
"Seven Acres of Surplus"

Copyrighted material

Brand New Govt. Surplus

FIRE EXTINGUISHERS

Save Lives—Business and Property

SAVE OVER $25.00

Underwriters Labelled

Foam Type (Steel) 2½ gallon Extinguishers. A recent government release now available for immediate delivery in original cartons.

SIMPLE TO HANDLE—EASY TO OPERATE

Fire can strike anywhere, quickly. Be prepared with this "Quick as a Flash" Fire Extinguisher. Perfect for use in homes, apartments, garages, hotels, stores, theatres, airports, filling stations, factories, warehouses, farms, ranches, etc. Manufactured by leading Fire Extinguisher Company. Comes complete with chemical charge and wall bracket.

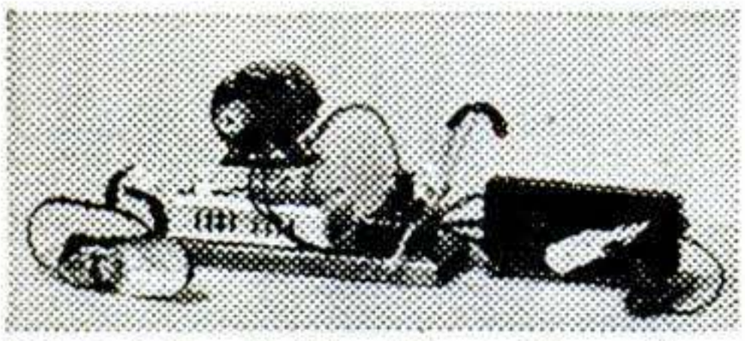
MONEY BACK GUARANTEE: To be as represented or money refunded. ORDER TODAY, NOW. Supply limited. Never again such a value. Regular list on this type, $37.00. A Real SAVINGS. Price FOB. K. C., Mo..... **$10.95**

Send check or M. O. for Quick Delivery

THOMAS EQUIPMENT CO. 2462 Grand Ave. Kansas City, Mo. VI. 3506

Say You Saw It In Popular Science

MOTORIZE ANY HOUSEHOLD SEWING MACHINE IN ONE MINUTE!



NO WIRING!
NO DRILLING!
AC or DC!
With Light and Foot Control

$20 POST PAID

"Quick Sew" (Pat.Reg.) Complete—Ready to Attach.

SEND CHECK OR MONEY ORDER TODAY!

SUNSHINE Mfg. Co., Dept. PS-6, 614 N. 3rd St., St. Louis, Mo.

Save Money-Make Money with **LARSON Leathercraft**

For gifts or for sale—make easy-to-assemble leather items. Complete stock leathers, tools, accessories.

Send ten cents for new catalog of 101 money-making ideas.

J. C. LARSON CO. 826 S. Tripp Ave. Chicago 24, Illinois

AMERICA'S LOWEST PRICED

TILTING BAND SAW

Engineering Features Found Only In Highest Priced Saws

NOW ONLY **$16.95**

Practical, modern design. Accurate, smooth operation. Cuts to center of 14" circle. 2½" thick. Genuine "Oilite" bearings, adjustable ball bearing blade guide. Blade tension adjustment. Safe, fully enclosed mechanism. Thoroughly proved construction, ruggedly designed of sturdy laminated plywood. Stands 24" overall. As illustrated, blade included. Immediate Delivery. Factory Guarantee. Price FOB St. Louis. Shipping weight 14 lbs.

Dealers Solicited Inquiries

THE JAY-KAY COMPANY

P. O. Box 234 Kansas City, Mo.

How to Make Liquid Marble

And BIG PROFITS In Your Own Business

Amazing Liquid Synthetic Marble can be made at home without machinery. Needs no heat or pressure. Can be poured into molds for casting expensive novelties. Liquid Synthetic Marble can be made in any color. It is even *more beautiful than genuine marble* because of its highly glazed finish. Costs far less. **FLEXIBLE MOLDS:** Make your own Flexible Molds. Cast novelties, statuary, desk sets, book-ends, etc. out of Liquid Marble, plaster and many other molding compositions. A large sized mold costs but a few cents. Hundreds of casts can be taken from a single mold. **UNLIMITED MARKET:** You will find steady year-round demand in your own community. No selling problem. We supply names of buyers for your finished products. Let **BING PRODUCTS** show you how to start with a small investment and build a permanent, independent, profitable business! Write now for **FREE CATALOG!**

BING PRODUCTS: Dept. PS-6A 88 BROAD STREET BOSTON 10, MASS.

AMAZING PROFITS IN YOUR OWN 1c VENDING BUSINESS!

Why work all your life for small wages? Easy to start a 1c vending machine business in your spare time. Year round money maker. No experience necessary. We show you how to do it. Write for NO RISK—NO LOSS starting offer, TODAY.

L. M. BECKER VENDING SERVICE, Brillion, Wisconsin

PORTABLE BENCH GRINDER $18.95— less motor and stones

Suitable for hobby shops and excellent for industrial work requiring heavy buffer or grinder. Rugged 100% steel construction. Life time sealed ball bearings. Adjustable tool rest easily fixed for face or side of stones. Convenient toggle switch. 13" between wheels allows wider range of work 6" x 1" x ½" stones—can be used until only 2" left. Can be permanently mounted or will rest firm without bolting. Costs only $18.95, without motor or stones. ⅓ H.P. GE motor, 60 cycle, $21.50. Bench grinder stones to fit, $2.50 ea. Send check or money order. Shipped F.O.B. Pasadena, Calif. ORDER DIRECT. Today. **Write for Free Bulletin No. 21-A**

MODERN MANUFACTURING CO., 160 N. Fair Oaks, Pasadena 1, Calif.

Brand New—In Original Cartons

Even-Balance SCALES

$11.00

16-pound capacity. Accuracy guaranteed to within 1/20th of oz. Have been tested and approved by California Bureau of Weights and Measures. Ideal for labs., stores and shops. Send check or money order. Shipped F.O.B. Los Angeles. Only $11.00. Limited Supply—**ORDER TODAY!**

WAR SURPLUS ENGINEERING SERVICE

2625 W. Pico Blvd. Los Angeles 6, Calif.

Now A DYNAMIC Industrial Transformer Type Super Charged WELDER

ONLY $28.50 COMPLETE

FOR AUTO—HOME APPLIANCE & FARM IMPLEMENT REPAIRS! WORKS ON IRON, STEEL & other metals . . . does work you'd expect from a larger, costlier machine; portable, easily carried; **OPERATES FROM ANY** properly wired **110 VOLT LINE.** Also available for 220 volt operation at slight additional cost; has 8 metalic & carbon arc welding heat stages. **EASY TO OPERATE TRANSFORMER TYPE WELDER**—If inexperienced you can learn to do professional work by following the **SIMPLIFIED WELDING & OPERATING INSTRUCTIONS FURNISHED**—comes complete ready to operate with helmet, rods, cable, instructions. **SAVE TIME AND MONEY**—Do your own welding—Just a few repair jobs will pay for this machine. A practical and profitable machine tool for any workshop. Make money doing repair work for others. Write today for full particulars and **10 DAY FREE TRIAL OFFER.**

DYNAMIC WELDER CO., 15 E. 23rd St., AH, Chicago 16, Ill.

Copyrighted material

Paint Your Car for ONLY $3.95

2 FULL COATS — ONE QUART DOES ENTIRE JOB

WITH **WYPE** TRADE MARK REG.

NO SPRAYING · NO MASKING · NO BRUSHING

AMAZING NEW BRUSHLESS AUTO ENAMEL

You *JUST WIPE ON* with a POWDER PUFF instead of Brushing or Spraying

ANYONE CAN DO BEAUTIFUL JOB

Dries Dust Free One Hour · No Streaks or Lapmarks

Get Beautiful Mirror Like Finish That Looks Like Spray Job!

At last! Practically anyone can now paint his car with WYPE! No previous car-painting experience necessary. You get a beautiful high-gloss job that gives you an expensive finish such as is sprayed on by Professional Auto Painters—at a fraction of regular cost! With WYPE you need **NO** BRUSH, **NO** SPRAY, **NO** MASKING! Just **WIPE ON** with Powder Puff—which we furnish at no extra charge. You get a brilliant, glossy finish that is truly "factory-like." No streaks. No lap-marks. Guaranteed for TWO years not to crack, peel, chip or fade, if simple directions are followed. Takes about an hour to apply. Dries dust-free in an hour. WYPE comes in nine most popular shades including those on newest model cars. Goes over any other color, lacquer or enamel.

MOST POPULAR COLORS

Black — Brewster (dark) Green
Maroon — Jewel (light) Green
Red — Washington (dark) Blue
Gray — Monticello (light) Blue
Sun Beige (light) Tan

$3.95 Per Quart

SEE YOUR DEALER or ORDER DIRECT
SEND NO MONEY · Get WYPE Today!

If your dealer can't supply you, just send us a postcard. We'll ship C.O.D. Just pay mailman for Wype, plus postal charges. Or send remittance with order and WE pay postage.

You're SURE You Are SAFE when You Paint with *WYPE*
HERE'S WHY!

TESTED BY U. S. Testing Co., Inc.

Leading Scientific Testing Laboratory

Report No. 87496
Jan. 5, 1948

and found to conform to the claims and guarantee of the Wype Corporation.

No higher or more rigid standards are set by any Testing Laboratory. United States Testing Company conducts scientific tests for the world's foremost organizations and is accepted as a leading authority on such tests.

For Your Protection

Before you buy any automobile paint, ask for proof that it has passed tests by a nationally known testing laboratory. Remember the value of your car! You can TRUST Wype.

2-YEAR GUARANTEE

We Guarantee WYPE against cracking, peeling, fading or chipping for two years after application, if applied according to directions furnished. Your money cheerfully refunded if WYPE does not live up to this Guarantee.

COPYRIGHT 1948, WYPE CORP

APPLY in ONE HOUR — DRIES to GLISTENING PROFESSIONAL FINISH

WYPE is a new Miracle Enamel for Autos. It is NOT a wax or polish but a hard high lustre ENAMEL finish! With WYPE, ANYONE can do a beautiful job! Order a quart to paint your car or to get started in this BIG-MONEY Business!

NO STREAKS OR LAPMARKS LOOKS LIKE SPRAY JOB

OVER 125,000 CARS PAINTED WITH WYPE

by the end of last season, and thousands more being painted every week. The final test of customer satisfaction—thousands of our new customers are being sent to us by old customers!

Used WYPE—Sold Car For $200.00 More

"Congratulations to Wype for production of the marvelous new paint, Wype. Wype has been definitely satisfactory. Needless to say, my husband was astonished, but, oh, so pleased. We realized about $200.00 more profit on our car when we sold it. Any lady, who can apply her own make-up, can certainly paint her own car!"—Mrs. Noma M. Burnette, Parris Island, S. C.

Some of the FAMOUS DEPARTMENT STORES that Sell WYPE

VISIT or PHONE THE STORE IN YOUR CITY...

If you live in one of the cities shown here, it will be more convenient to buy from your favorite department store. Ask your dealer! Leading merchants everywhere sell WYPE.

Akron: M. O'Neil Co.
Baltimore: May Co.
Boston: Jordan Marsh Co.
Buffalo, N. Y.: J. N. Adam & Co.
Chicago: Goldblatt's 15 Dept. Stores (Goldblatt's, also, at Joliet, Ill.; Hammond, Gary & South Bend, Ind.)
Cincinnati: Fair Store Co.
Cleveland: May Co.
Dallas: Sanger Bros., Inc.
Denver: May Co.
Detroit: People's Outfitting Co.
Ft. Worth: W. C. Stripling Co.
Grand Rapids, Mich.: Herpolsheimer Co.
Hackensack, N. J.: Packard-Bamberger Co.
Houston: Foley's
Indianapolis: Wm. H. Block Co.
Kansas City, Mo.: Jones Store Co.
Los Angeles: May Co.
Louisville: Kaufman-Straus Co.
Memphis: B. Lowenstein & Bros.
Milwaukee: Ed. Schuster & Co., Inc.
Minneapolis: Donaldson's
Montgomery: Montgomery Fair Store
New Orleans: Maison Blanche Co.
Newark, N. J.: Bamberger's
New York: Gimbel's
Philadelphia: Lit Brothers
Pittsburgh: Kaufmann's
Providence, R. I.: The Shepard Co.
Richmond, Va.: Miller & Rhoads, Inc.
Rochester, N. Y.: Sibley, Lindsay & Curr
St. Louis: Famous-Barr Co.
St. Paul, Minn.: The Golden Rule
San Antonio: Joske's of Texas
San Diego: Whitney's
Syracuse, N. Y.: Dey Bros. & Co.
Toledo: Lion Dry Goods Co.
Washington, D. C.: Lansburgh & Bro.
Youngstown, O.: Strouss-Hirshberg Co.

WYPE CORP. Dept. 17-F 2214 DOLMAN ST. ST. LOUIS 4, MO.

Copyrighted material

GET THIS COMPLETE GARDEN AND LAWN CART SET

ENDS HEAVY HANDLING AND HAULING

LAWN AND LEAF CART
Easiest way to haul leaves, grass and trimmings you ever saw. Holds 10 bushels each trip. Light, strong and sturdy frame. Mildew and rot proof bag. Folds flat to hang up when not in use. Sells individually for **$12.95.**

UTILITY TRUCK
No end of uses for this handy, patented truck. Open body carries stones, bricks, plants, soil, fertilizer. Closed body forms platform for baskets, ash cans, barrels, boxes, etc. Husky disc wheels and solid rubber tires insure quiet operation, don't mar lawn. Capacity 500 lbs. Folds flat to hang up when not in use. Sells individually for **$9.75.**

SPRAY TRUCK
Designed to carry 3 gal. spray tank as shown. Has many other uses such as golf bags, cans, etc. Tubular frame, sturdy construction. Heavy disc, rubber tired wheels. Rubber handle grip. Sells individually for **$7.95.** (Tank Not Included)

ALL FOR $25 Express Collect

Make your garden work easier, lighter, more pleasant with this complete set. Will give years of service.

CONNIE BERT CO., 8115 Clinton Road, Cleveland 9, Ohio

Brand New! **GOGGLES**
AIR CORPS B-7
GOV'T SURPLUS

The perfect goggle for outdoor sports — motorcycling, bicycling, hunters, factory, farm and industrial workers. ADJUSTABLE METAL FRAME, optically ground and polished PRECISION CLEAR GLASS LENS, chamois lined rubber cushion, elastic headband. Verified cost to Gov't $10.74. Send only $1.89. We pay postage. Add postage on C.O.D. orders. Your money back if not satisfied!

$1.89

PAUL VARKELL CO.
37 West 39th St. New York 18 · LO 4-7914

Make BIG MONEY . . . in PLASTICS

Send for FREE CATALOG
WRITE NOW!
No obligation

Learn how YOU can start your own profitable Plastics business for just a few dollars. No experience necessary, we teach you how, furnish you with all supplies and Marketing Helps. This is your opportunity! DON'T DELAY!

COLONIAL PLASTICS CO. · 216 S. 7th St., St. Louis, Mo. Dept. S-2

BURN WATER IN YOUR CAR

OCTA-GĀNE
Water Injecting Carburetor

NEW **OCTA-GĀNE** WATER INJECTING CARBURETOR GIVES
- Better Mileage & Pick up
- More Power & More Pep
- Cleaner & Cooler Motor

OCTA-GĀNE is the Only Water Injecting Carburetor Engineered on the Venturi Principle

Only $22.25 Complete with Tank

SEND TODAY!
Mail postcard for particulars

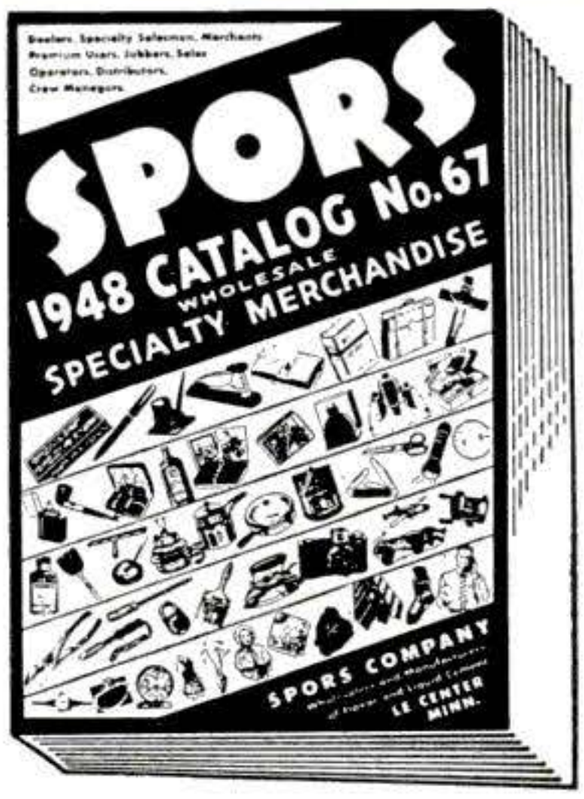
Continental Carburetion
456 Station A, Richmond, Calif.

DEALERS Write on your letterhead for information and discount sheets.

HOT WATER SHAVE • BATH • WASH

Don't use chilling cold water when instant hot water makes shaving, bathing, washing easier and pleasanter. Just plug into electric 110 AC or DC and you have your instant hot water when and where you want it on our 10-day guarantee. Send no money—just your name and address on postcard. We ship C.O.D. plus few pennies postage. Or we ship postpaid your order if cash accompanies.

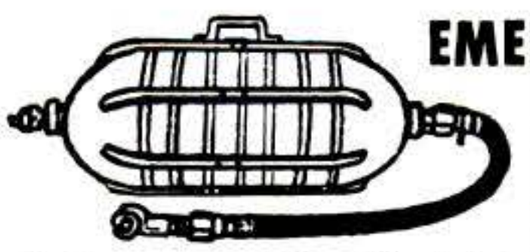
MIDWEST MERCHANDISE MART
Dept. 42-11 **ELKHORN, WIS.**



6000 SMASH HITS— IN 324 PAGE
Wholesale Book

Dealers, agents, salesmen and jobbers, you will find this book bulging with Tested Money Makers. Latest catalog shows average price reductions about 21% on many items. A guarantee of satisfaction stands back of every purchase you make from us. 25c brings you this latest 1948 wholesale catalog of Tested Sellers. You may take credit for the 25c on your first order. In that way the Book will not cost you any money. Get your copy now, before supply is depleted.

SPORS CO. **4-48 Smith St.** **Le Center, Minn.**



EMERGENCY SUPPLY TANK

Fill at any gas station. 150 lbs. airs 5 flat tires. Inflates rubber boats. Use for touch-up spray jobs, tire service truck, air horns, dust out motors, machinery, etc.

Shatterproof 12"x24" stainless steel tank with carry handle, check valve, two feet hose and tire filling chuck. Only **$7.95**

Tank only 12"x24", tapped each end ¼ pipe thread. 500 lb. pressure. Build your own. Ideal for paint spray, air receivers, net floats, buoys, etc. Each **$4.75**

Small size tank, 6"x24". Only **$2.98**

Prices FOB, K. C. Write for new catalog.

MIDWEST SURPLUS SALES CO.
2531 Indiana **Kansas City, Mo.**

RUGGED? YOU BET!
BELL WATER-SHOCK RESISTANT

Handsomely styled, precision tested, built to take hard usage, ready to go places.

No. CP 220—ALL-STAINLESS STEEL CASE, 17 jewels, anti-magnetic, radium dial and hands, unbreakable crystal, sweep second hand. (Price Includes Fed. Tax and Postage)..... $29.95

NOW AT NEW LOW PRICES

Order Direct from BELL. Mail check, money order or pay C.O.D. Write for FREE Booklet "CP"

BELL WATCH COMPANY, INC.
9 Rockefeller Plaza, Suite 909, New York 20 N.Y.

Copyrighted material

SAVE UP TO 85% in WAR SURPLUS...SENSATIONAL VALUES at "GADGETEER'S HEAVEN"

IN MANY ITEMS WE HAVE THE WORLD'S LARGEST SUPPLY

MACKINAW

Made of heavy water repellant poplin cover. Wool Blanket lined, thigh length sleeve flap for adjustment. An ideal coat for the outdoor man Truck Driver, Hunter, Farmer.

$7.89 each

NEW DUST RESPIRATORS

200,000 in 5 different types with adjustable hd. bnds. Bi Valve Type **29c** each

M-1

in lots of 50.25c ea. 100 or more.19c ea.

FOR PNEUMOCONIOSIS— producing dusts, road dusts, mists, & chromic acid mist, produced in crushing, mining, road building, abrading, farming, drought, painting, spraying, etc. Ideal for Farm, Mill, Factory, Garage, Foundry.

COMFO-RESPIRATOR

dual-disc, Style BM-2101, with 10 extra filters, a $3.50 value.

$1.59 each

WILSON CO., dual disc, type J-750 with 10 extra filters in appearance like BM-2101 **$1.29** each

PULMASON RESPIRATOR

with Felt Filter.

P-1 **79c ea.**

AMERICAN OPTICAL CO. RESPIRATOR

Style R-9100 small & compact especially suited to laboratory & hospital work. **59c** ea.

MICARTA TUBE

Ideal for Insulation or Bushing Stock. 36" x 1/4" wall x 1" O. D. Original use was for trailing antenna - F 10. Use for towel rack, souvenir displays, shafting spacers, bearings, etc. In original carton. **59c** ea.

Radio ANTENNA Reel

#711

Just the thing for tuning beam antenna.

Powered by 1/8 h. p. 24v G. E. Motor. Removable 6" Reel-limit Switch - Cam Worm gears, Bevel gear. Solonoid clutch.

Motor engaged to gear reduction only when electrical contact made. Operates in either direction. Ideal for auxillary power take-off, opening and closing doors, etc.

A TREMENDOUS VALUE **$4.29**

RADIO HEAD SET

AN-BH-1 with Leather Sponge Rubber Pad - A Wonderful Buy

Excell. Condition Low Impedence

$1.00

BC 306-A NEW SIGNAL CORPS TUNING UNIT

In heavy alum. case with black crackle finish-18"x10"x8". Velvet vernier dial knob, calibration 0-100, with locking assembly. Switch - 5 position with knob. 4½" diam. coil with three others inside, and movable induction tuning coil. WORTH MANY TIMES MORE

$1.89 ea.

MESS TRAY

6 compartments, rustless, stainless steel. Barbecue, outdoor cooking, save dishwashing. Hospital, Restaurant, Home, or roughing. #311 New **83c** ea.

#311A Used but in Fine Serviceable Condition ..... **59c** ea.

SLEEPING BAG

NEW! 100% wool. Mummy type. Heavy duty 30" zipper. $1 extra for used water repellant cover

Gov't. cost $22.00 #303 **$4.95**

NEW HUNTING KNIFE #307

6" chrome vanadium blade 4" handle, leather grip. In leather sheath.

$5.98 Value For Only **$1.69**

HUNTING KNIFE

Like above but black Parkerized Finish. #307A ..... **$1.39** ea.

BOLO KNIFE

10" x 2" Parkerized Blade 5" Gripped Handle, Weight 1½ lbs. Ideal for Hunting, Clearing Brush, or Trails ..... **99c** ea.

TEAR SHAPED PLEXI DOME

FISH & FLOWER BOWLS, CAB ROOF LIGHTS

Overall length 21." width at widest point 11." at base 4." 6" deep.

#70-1-A **$1.39** ea.

24 Pc. PLASTIC KIT. Plexiglass, Lucite, Dye Colors, Cement, Project Book of Plans and Instructions.

For Plsr. and Prft. #701B **$2.39** ea.

FLYING HELMET

#407 Fleece-lined winter **$1.59** ea.

Ideal for cycle drivers, racers, sportsmen. Used,

CANVAS HELMET

but in excellent condition. #407 A —Summer weight **69c**

NEW OXYGEN MASK

A-14 Demand type **$3.50** ea.

Slightly used but perfect **$1.95** ea.

Used but with mike **$2.50** ea.

DRIFTMETER

Used for Drift & Air Speed. Can be Dismantled for:

1. Acromatic 85 MM Double Lens. 2. 51 MM 2.01 Double Lens; 3. Engraved Scales; 4. Sponge Rubber Discs; 5. Hinges, Metal Parts; 6. Slide Viewer Parts; 7. Tracer Parts. Can be adapted to 35 MM Projectors, Portrait and Enlarging Work, Pantograph, etc., by Draftsmen, Artists, etc. Information Bulletin with ea. Drift Meter Gov't Cost $20..00. Yours for Only **$4.98**

PILLOWS

CURLED CHICKEN FEATHERS 26" x 17" **99c** ea.

#424

Blue & white ticking. New, but still Renovated and Sterilized, in accordance with Laws of Califorina.

SUNGLASSES

Plastic Frame

Optic Ground, Poloroid Type With Carrying Case. 56-1 **$1.29** ea.

GOGGLES

New One Pc. Type Shatterproof Sponge Rubber Frame, Flexible Lens. Colored and Poloroid. GO-1 **59c** ea.

Metal Frame With Adjusting Button and Sponge Rubber Cups. Ideal for Motorcycling GO-2 **79c** ea.

CANTEENS & COVERS

1 Quart Aluminum, Porcelain Lined and Cvrd. Plastic Screw Top, Slighlty used but Perfect. Canvas Cover, Felt Lined with Belt Holder **59c** ea.

Button Fastened ..... **29c** ea.

Canteen Cups, Aluminum ..... **19c** ea.

TANK TELESCOPE

For Fun & Utility 3 Power

#201 T M-5A1 **$4.95**

BED TRAY-TABLE

adjustable legs, removable tray spreads 33" x 12" high on bed.

Stainless steel formed tray is 17" x 23".

Made of light weight metal. **$4.49**

MUKLUKS

Knee height, double thickness, feather filled, water repellant body, leather foot with adjustable knee strap and instep lace, also 8" pocket on shank. You'll love 'em in the cold winter sports. **$4.29** pr.

NEW AIRCRAFT ALUMINUM BUCKET SEAT

#910

Use for boats, jeeps, tractor seats, etc. 17" x 18" seat, 18" x 24" back. Rib enforced. Adjustable height tube mounting. Wide, high back gives excellent support. Easily installed. Shipped in original carton.

You'll appreciate the buy at **$4.95**

CUSHIONS

New imt. leather cushions, yellow pigskin color. Filled with kapok. Will float. Size - 22½"x17"x1½" thick.

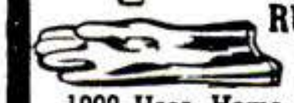
At fraction of Gov't. cost.. **$2.95**

New Navigators Magnetic Compass

D-12

type D-12 size 7" dia x 4½ deep Rubber lined - rotating verge range ringe calibrated in 1 degree from 0-360° with 2 parallel grid wires for alignment with N. S. line. Boats airplanes. **$17.95** ea.

RUBBER GLOVES



Neo-Prene, Protective. Impermeable 1000 Uses. Home Farm, Factory or Laboratory Pr. **69c**

Elgin 15 Jewel Waltham STOP WATCH

Pocket style. Shatterproof crystal. Split seconds (1/10ths). Waterproof. Stainless steel, spring suspension Case. NEW **$12.95** #300

Aviation Emergency Vests

Sturdy, Yet Light Weight, Satin Lined with Tie Straps. 14 Outside Pockets, Plus Knife, Gun, or Tool Leather Holder, 2 large 11" x 8" Pockets Inside, Wonderful for Hunting, Fishing, or Mechanic.

Cost the Government $30. A Steal at ..... **$2.49** ea.

AV-1

Here it is! Everyman's Favorite the

EISENHOWER JACKET

Sizes 34 to 40. Used, but in Perfect Condition. While They Last **$3.99** ea.

NEW TARPS HEAVY CANVAS

Mildew & Flame Resistant. Cheap Outside Storage. They are Really Moving at These Prices.

5' x 7' **$3.95**

8½' x 10 **$8.50** 9"x16" **$11.95**

Rubberized Nylon NEW Tarps, 7' x 11' $6.95

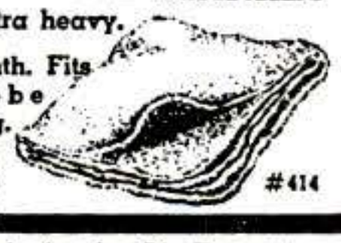
Rubberized Linen 7' x 11' $5.95

Only 3 lb. light weight yet waterproof. Ideal for outside car storage, etc.

NEW 100% ALL WOOL BLANKET

7 x 7 ft. Extra heavy. Also Double warmth. Fits Wood's Robe sleeping bag.

$4.65



#414

'Twas Made for the Air Forces!

THE BEST

Loose Leaf BINDER

You ever saw - 3 metal post. Cylindrical locking heavy duty 3 16" fabricated hinged cover. End identification window. Ideal for price books, salesman cataloques, photo albums, students, publications, Reference books, artist sketch books, etc. Will hold 500 sheets, 8½" x 11". A $5.00 Value for Only ..... **59c** ea.

50 Page Binder Bond Fillers for 25c Extra.

HORSEHIDE WORK GLOVES

ALL LEATHER GAUNTLET TYPE REINFORCED PALMS & FINGER STITCHING. LENGTH 13¾" #381 **$1.95** pr.

ALL LEATHER WRIST Length 10¼" ..... **$1.55** pr.

Barbed wire, welding, all purpose work gloves.

A Steal . . . Gov't. cost many, many times more.

COMPASSES

#151 Marching, lensite, with luminous dial **$1.59**

#152 Matchbox, both jewel & liquid floating dial **39c**

#154 Wrist strap Compass **69c**

ORDER DIRECT FROM THIS AD

FREE - LARGE ILLUSTRATED CATALOGUE

All sales final. Make remittances by money-order, bank draft or personal check. Purchase orders acceptable from D & B firms. All quotations F. O. B. Los Angeles. Send 1/3 deposit with C. O. D.. orders. Also Complete Aircraft Supplies

PALLEY SUPPLY CO. THE LARGEST FIRM OF ITS TYPE IN THE WORLD

DEPT. P. S. 68 — 6321 SAN FERNANDO RD. GLENDALE 1, CALIFORNIA

Copyrighted material

FAMOUS CLINTON GASOLINE ENGINES...

• NEW. Complete, ready-to-run, compact, dependable 4-cycle single cylinder aircooled gasoline engines, by world's largest producer, specializing in 1½ to 3 H.P. engines. Over 300,000 in world-wide use.

MODEL 700 ABR 6

1½-2 H.P. MODEL 700A $59.50
2½-3 H.P. MODEL 1100A $74.75

Rope starter, direct drive models 1200 to 3600 r.p.m. for power tools, lawn mowers, air compressors, wood saws, etc.

1½-2 H.P. MODEL 701AS $72.50
2½-3 H.P. MODEL 1101AS $87.75

Kick starter attached, direct drive for scooters, midget autos and machinery.

1½-2 H.P. MODEL 700ABR6 .....$75.00
2½-3 H.P. MODEL 1100ABR6 .....$90.25

Gear reduction 6 to 1, built-in, for machinery, garden tractors, conveyors, etc., requ ring shaft speeds from 200 to 600 r.p.m

ORDER DIRECT---AND SAVE!

These are all Factory-Fresh Engines—Not War Surplus—With standard 90-day guarantee. Order with confidence. Send Check or Money Order. Immediate Insured Deliveries. Michigan purchasers only—include 3% sales tax. Free literature.

CLINTON ENGINE CO. • 16353 East Jefferson • DETROIT 30, MICH.

FOR CAMPERS • SPORTSMEN

stowaway trailer

Carries 400 lb. of duffel, provisions, fish, game, etc. Eliminates parking problem when not in use, stows away in car or closet. 5 minutes to take apart or assemble. Weighs only 50 lb. Sturdy aluminum-alloy frame, durable waterproofed canvas deck, standard pneumatic tire and tube, Timken-bearing axle, steel wheel. Thoroughly proved, hundreds in use.

Send for free illustrated booklet

Immediate shipment. Only $79.50 direct from factory; complete, ready for use. Add $2.95 Fed. Excise Tax. Add sales tax in Calif. Enclose money order or check with order to save shipping charges. Otherwise, sent C.O.D., f.o.b. Los Angeles.

TRAILER DIVISION
McCULLOCH MOTORS CORP.
6101 West Century Blvd., Los Angeles 45, California

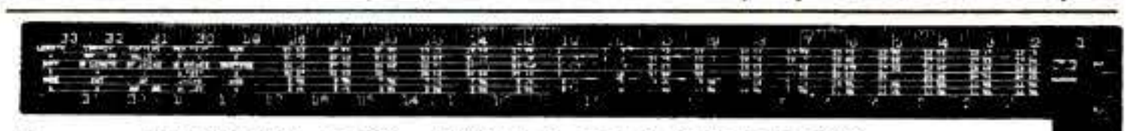
RE-STRING RACKETS AT HOME

FREE Write for our 1948 Catalog and Instruction Sheet.

• EARN MONEY • WITH THE WONDER VISE

It's pleasant, profitable work. No experience or skill required. Easy to learn. Full line of guaranteed **Stringing Tools, Frames, Gut and Silk Strings.** Every item high quality.

W. A. BICKEL & CO.
803 South Boulevard, Dept. A-53 Oak Park, Ill.



HOW TO CUT RAFTERS

New vest pocket book gives lengths, side cuts, plumb cuts, deductions. For all rafters for any building from one inch to forty feet wide. Gives numbers to cut on square. Also degrees for same cuts for Radial Saws. All standard pitches from ⅛ to ⅝. Just open book to pitch page and there are your lengths, side cuts, etc. Anyone who knows what a jack rafter is can frame a roof if he has this great book. Price one dollar, ($1.25 in Canada). **Builders' Topics, Dept. S, Lock Box 828, Seattle, Washington.** CARPENTERS, PLUMBERS, PLASTERERS, ELECTRICIANS, ETC. subscribe for Builders' Topics, the monthly magazine for HE-MAN CONSTRUCTION WORKERS. Only $1.00 per year. (In Canada—$1.25). Sample copies 25c.

BARGAINS UNLIMITED

Hundreds of money-saving values at today's lowest prices—for your every need.

FREE CATALOG of Refrigeration, Radio, and electrical Supplies. Send for yours at once!

G. & E. EQUIPMENT SUPPLY CO.
Ogden at Fulton — Chicago 7, Ill.

MEN'S FULLY GUARANTEED *NEW* $

15-JEWEL WRIST WATCH 13.95 PLUS TAX

ORIGINALLY *sold up to* $55

Sacrificed because they're post-war surplus

LOOK AT THESE FEATURES:

Luminous dial . . . sweep second hand . . . waterproof . . . shockproof . . . anti-magnetic . . . imported Swiss precision movement and case.
You get them now for a small fraction of original prices. Don't delay! Order now . . . while they last. **Send only $1** down payment with order. Pay balance to postman on arrival, plus postage. Or we pay postage if you enclose $13.95 plus $1.39 Fed. Tax.

Receive Reg. $2 expansion band FREE with prepaid order. Money back in 5 days if not delighted. Order now.

MARYLAND DISTRIBUTORS, Dept. 55
501 E. Baltimore St., Baltimore 2, Md.

NYLON FISH LINE $1.98

Approximately 1500 Feet
2 ply (25 pound test)—rubberized—waterproof—long life. Send remittance—postage prepaid.

ALLENDER & CO., Dept. 707, 2346 So. Dearborn St., Chicago 16, Illinois

---

STALL-PROOF your CAR, TRUCK, MOTORBOAT

with the Revolutionary START-O-MATIC

• Here at last . . . a new automatic device to start your engine with **only** a turn of the ignition switch. Will start the engine **automatically** when unintentionally stalled! The START-O-MATIC is easy to install on most cars . . . comes complete with full instructions. Will last indefinitely with no maintenance. Does not affect normal running of engine. 10 DAY MONEY BACK GUARANTEE. Dealer inquiries invited. Stall-proof your car today with a START-O-MATIC!

COMPLETE $19.85 *Give make, model and year when ordering.*

WALTER L. WRIGHT COMPANY
5 Court Square, Long Island City, New York

Say You Saw
It In Popular Science

AMBITIOUS MEN!

Here Is Your Opportunity To Open An Office Under Your Own Name Requiring No Room Or Box Number, at an amazing low price—

Only $12.00 and $24.00 Per Year

• THIS YEAR is expected to be the biggest in mail order history. So, if you want positive results, whether you have a business service, or merchandise to sell, or, an idea or patent to offer, you simply advertise it under your name, and 126 Lexington Avenue, New York 16, and that is all. From then on, you will have an office, and the co-operation of a well trained personnel.

CO-OPERATIVE OFFICE SERVICE, 126-P Lexington Avenue, New York 16, N. Y.

Copyrighted material

Amazing 2 for 1 Offer!

Paint Your Car with LUSTR WIPE

THE MIRACLE NEW AUTO ENAMEL THAT WIPES ON WITH A POWDER PUFF!

Fix Body and Fenders WITH DURO AUTO BODY SOLDER AT NO EXTRA COST!

BOTH
LUSTR-WIPE New Auto Enamel and DURO Auto Body Solder
AT ONE PRICE
only $3.95
Applicator Furnished

SEND NO MONEY MAIL COUPON NOW

ONE QUART OF LUSTR WIPE
PAINTS YOUR ENTIRE CAR
Anyone Can Do a Beautiful Job

LUSTR-WIPE is different than any auto enamel you ever tried. WORKS LIKE MAGIC! Almost ANYONE can paint his own car and get a high gloss finish that looks like a professional spray job. JUST WIPE IT ON with a powder puff. NO BRUSH, NO SPRAY, NO MASKING. NO STREAKS, NO LAPMARKS. Takes about an hour to get a brilliant "factory-finish." Dries dust-free in an hour. Goes over any enamel or lacquer.

NO BRUSHING
NO SPRAYING
NO MASKING
NO STREAKS

10 POPULAR COLORS

BLACK	$3.95 Qt.
GREY (Gunmetal-Dark or Air Wing-Light)	3.95 Qt.
GREEN (Brewster Dark or Jewel-Light)	3.95 Qt.
BLUE (Washington-Dark or Monticello-Light)	3.95 Qt.
RED or MAROON or SUN BEIGE (Tan)	3.95 Qt.

GUARANTEED FOR 2 YEARS
Not to crack, chip, peel or fade if simple directions are followed. LUSTR-WIPE is NOT a wax or polish but a marvelous Auto Enamel.

SEND NO MONEY! ORDER TODAY!
Mail penny postcard. Then pay postman for LUSTR-WIPE plus postal charges. DURO Auto Body Solder will be included AT NO EXTRA COST. Or if you send money with order, WE pay postage.

DURO PLASTIC METAL BODY SOLDER

FIXES FENDERS AND BODIES LIKE NEW

DURO is foolproof—EASY TO USE. Fixes rust spots, cracked and dented fenders, body dents and rusted out holes QUICK AND EASY. Just apply right out of the can with putty-knife. Dries to metallic hardness overnight. Can be filed down smooth, sanded to the same finish as metal and painted. You never know it's there.

A Can of DURO GIVEN with Every Quart of LUSTR-WIPE

Fenders Rusted Out?

LUSTR-WIPE CORP., 166 W. WASHINGTON ST., CHICAGO 2, ILL.

AGENTS AND DISTRIBUTORS WANTED
Write for tried and tested money-making plan. Also our special quantity prices.

LUSTR-WIPE CORP., 166 W. WASHINGTON, DEPT. 63, CHICAGO 2, ILL.
Please send me_____qts. of LUSTR-WIPE Auto Enamel at $3.95 Qt.
With each quart include a can of DURO Auto Body Solder AT NO EXTRA COST.

COLORS_____ NAME_____

☐ Send Postpaid, Full Payment of $. . . . (check or M.O.) enclosed
☐ Send C. O. D. plus Postal Charges
☐ Send Information for Agents

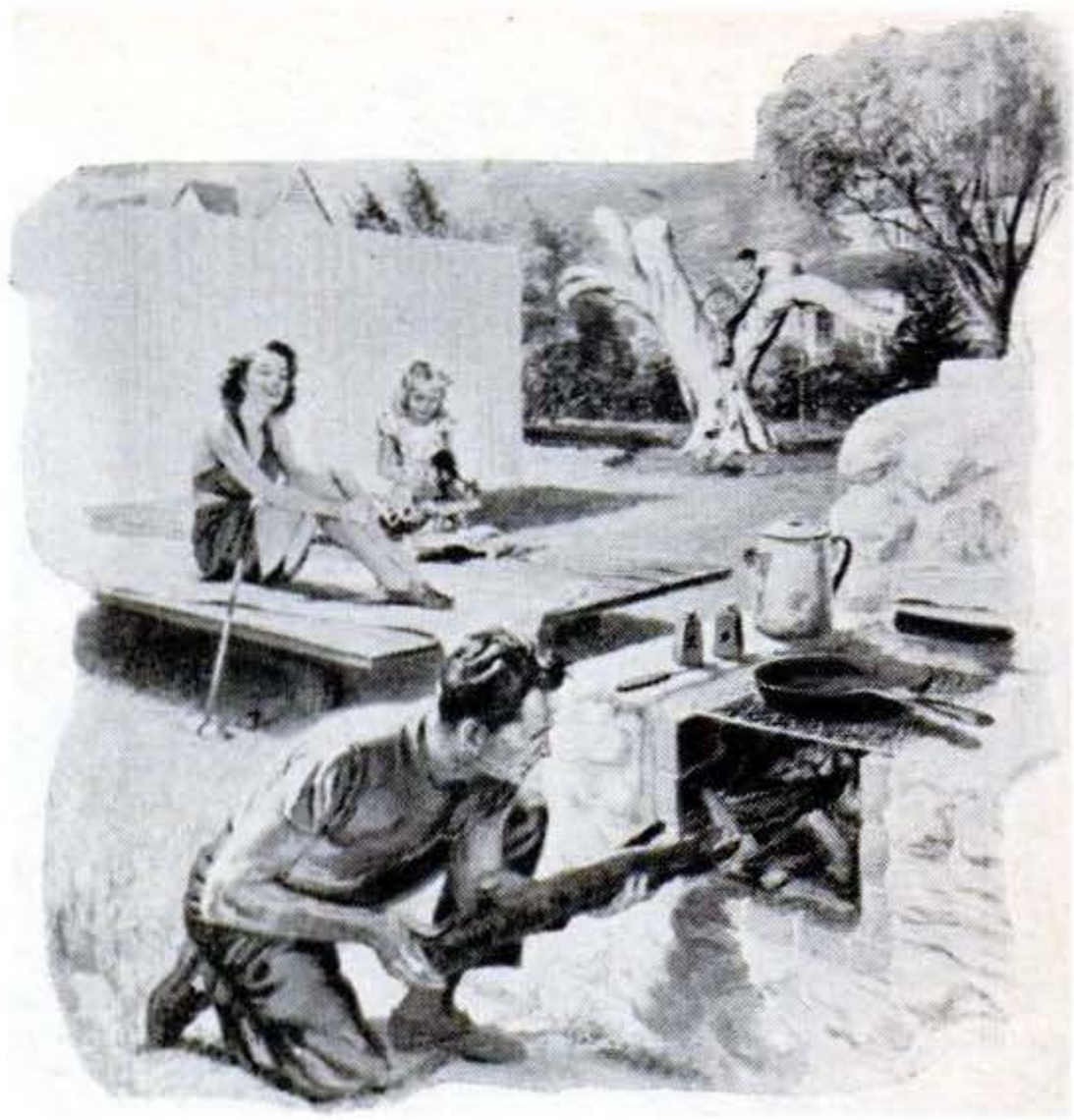
ADDRESS_____

CITY_____ ZONE____ STATE_____

Copyrighted material

TO: Reader
FROM: Editor

Right in Your Own Back Yard



THE worst winter in history was deep and white in *our* back yard when we started thinking ahead to this June issue. But it's part of our job to leapfrog seasons: arranging the millions of little pieces that go into Popular Science and printing a million copies of the magazine take time.

We figured this was going to be a tough summer, too. Lot of people with the itch to go—and no place. Lot more cars, but not enough new cars. Not enough room on the old roads to go around. Not enough money, at present prices, to go around.

So, we thought, a lot of people would probably be interested in staying home in the homes they were lucky to have. Now, fun at home is not exactly a new idea. In fact, this magazine has run a number of pieces about it. But this time we wanted something more than dimensional drawings for a back-yard barbecue. We wanted to sell the total idea and the simple principles. We wanted to show *you* how to find your *own* ideas right in your own back yard.

First we talked it over with Arthur Bartlett, a handy man with an idea himself. He and the whole editorial staff began puffing out possibilities like popcorn. Then artist Ray Quigley got into the act. In no time, we had more suggestions than we could cram into a whole issue. The story began to spread like the smell of a steak.

As a result, we got more than an article: we got a cover feature. And I'll bet a steak to a frankfurter the Bartlett and Quigley families, at least, will have more fun at home this summer.

The pictures are certainly as idyllic as a resort folder. The cost ranges from a few bucks to a few hundred—but you can be sure it will be less than a hotel bill.

Like the PS April article, "10 Easy Ways To Get That Extra Room," the piece about Back-Yard Resorts begins with what you've *got* and what you *want*.

What do you need for a family recreation center?

. . . a feeling of privacy—that means a fence.

. . . food facilities—that means anything from a tray of hamburgers to an electrified barbecue pit.

. . . sun and shade—that means a blanket under a tree or a complete outdoor living room.

. . . game facilities—that means what you like, but reduced to minimum terms.

. . . play space for children—that means maximum separation, but under your eye if out of your hair.

. . . water, from a sunken wash basin for the kids to a pool for yourself.

These are the basics: you mix them to suit your yearning and spending ability.

Our story shows how these basics can be combined, and how some can do double duty, like the low-built play and sun table that needn't be rushed out of the rain, and isn't so much trouble to set up that you never use it. This and some kind of screen are all you may need. It's a bench when you sit on the edge to eat, a game table, or a sunning platform.

But the big idea of this PS piece is not to give you ideas, but to show you how to find your own.

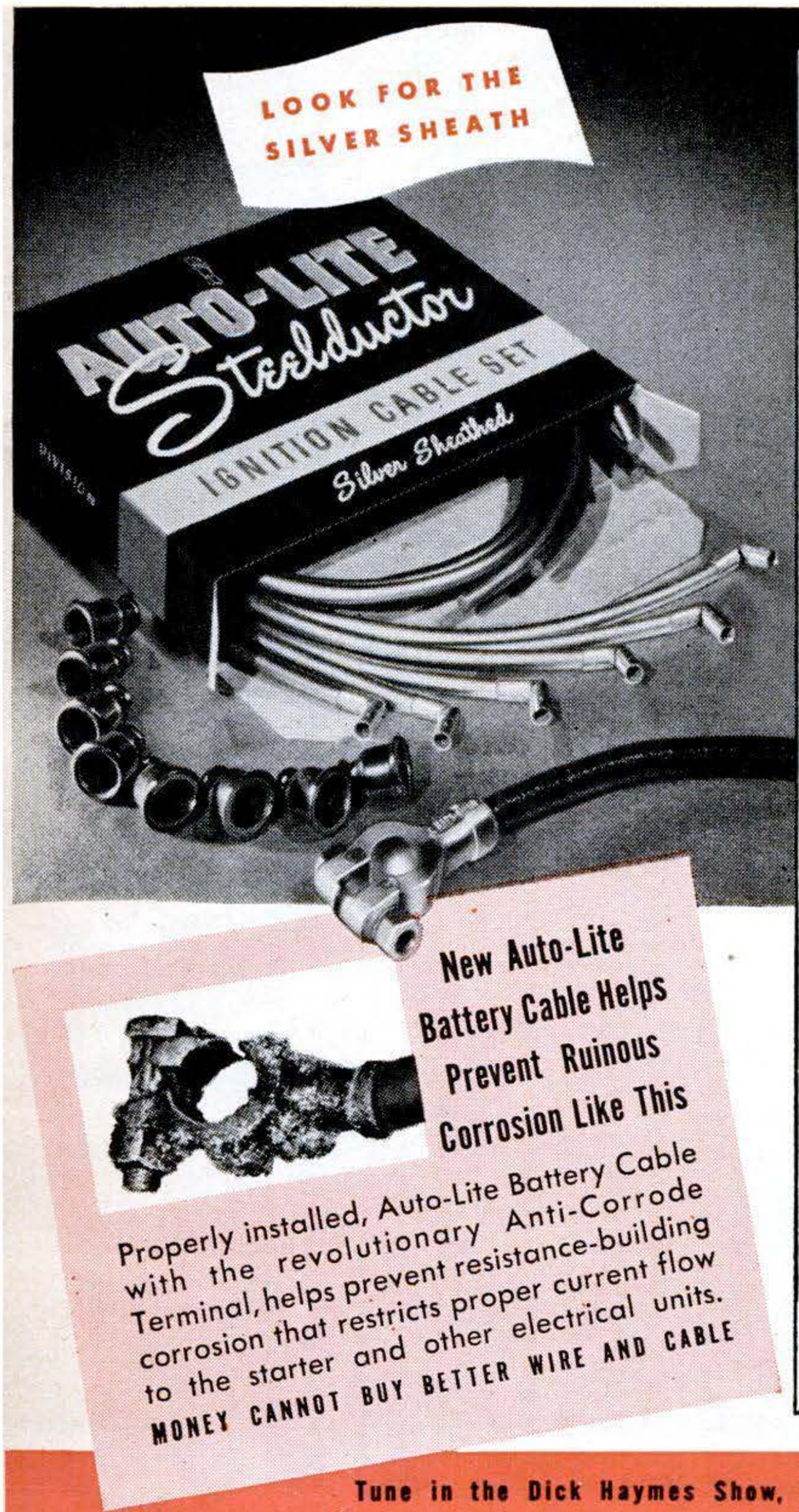
Happy homing!

PG

Copyrighted material

WHEN Winter Weary WIRE NEEDS REPLACING

Switch to AUTO-LITE



NEW AUTO-LITE *Steelductor* SPARK PLUG WIRE

RESISTS MOISTURE, HEAT, OIL and ABRASION

If your car's wiring is winter-weary, replace it with Auto-Lite Steelductor, the seven-strand stainless steel wire used on war planes, that offers marked advantages in shielded systems. Steelductor is available on spools or in packaged sets, cut-to-length with terminals, for all popular makes of cars.

You can count, too, on Auto-Lite full-gauge Battery Cable with Anti-Corrode Terminals for best results in your car.

THE ELECTRIC AUTO-LITE COMPANY

Toronto, Ontario — Toledo 1, Ohio

Tune in the Dick Haymes Show, for Auto-Lite Thurs., 9:00 P. M., E. T., CBS

Copyrighted material

9" x 3' Model C Bench Lathe—$171.60
complete with ¼ h.p. motor and drum switch

9" SOUTH BEND LATHE

This South Bend 9" Precision Lathe is the basic tool for your shop. It enables you to perform accurately the same full range of operations done on South Bend Lathes in industry. Also, operations ordinarily performed on other machine tools are made possible through the use of efficient attachments. You get more for your money in a South Bend 9" Lathe.

Write for Catalog 9-F or see local distributor—you will find his name under "Machine Tools" or "Lathes" in your classified telephone directory.

NEW 14" DRILL PRESS — a ruggedly built tool unsurpassed for accuracy and dependability. Prices start at $98.00, f.o.b. factory.

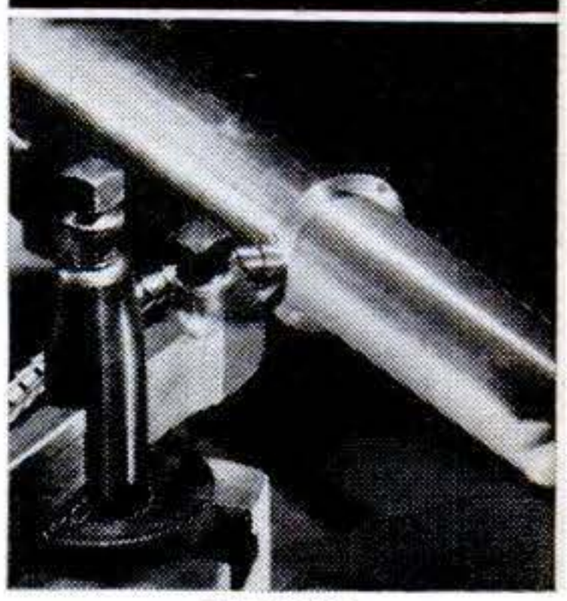
REG. U.S. PAT. OFF. & OTHER COUNTRIES

SOUTH BEND LATHE WORKS

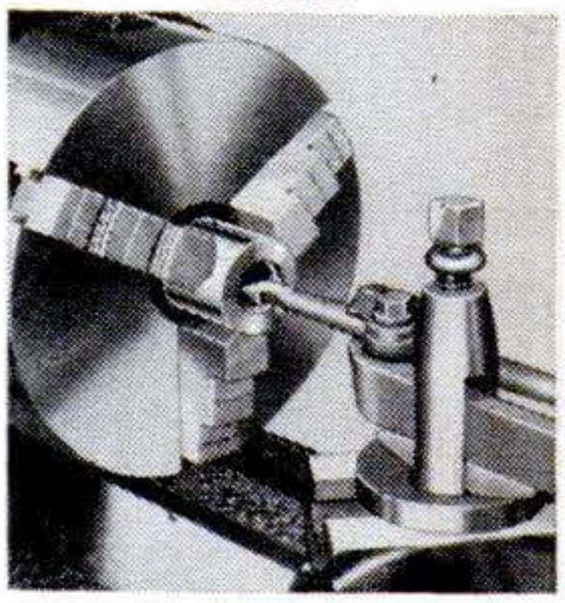
Building Better Tools Since 1906

456 EAST MADISON STREET, SOUTH BEND 22, INDIANA

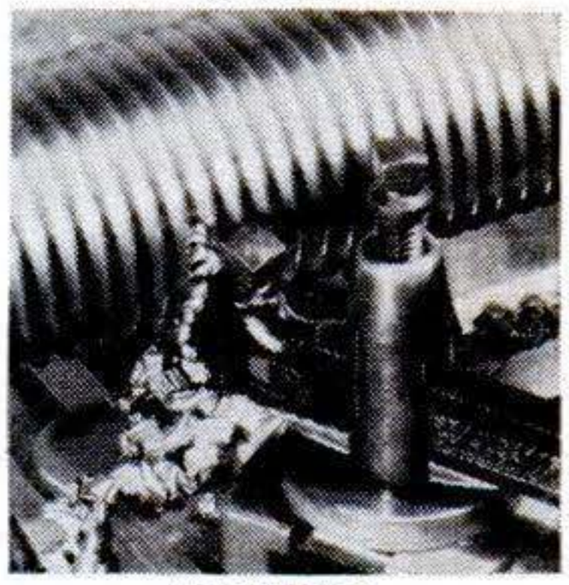
A Few of the Many Operations You Can Perform



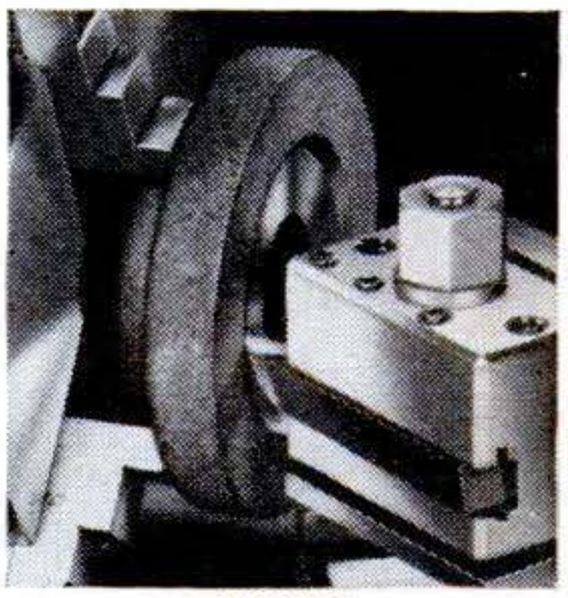
TURNING



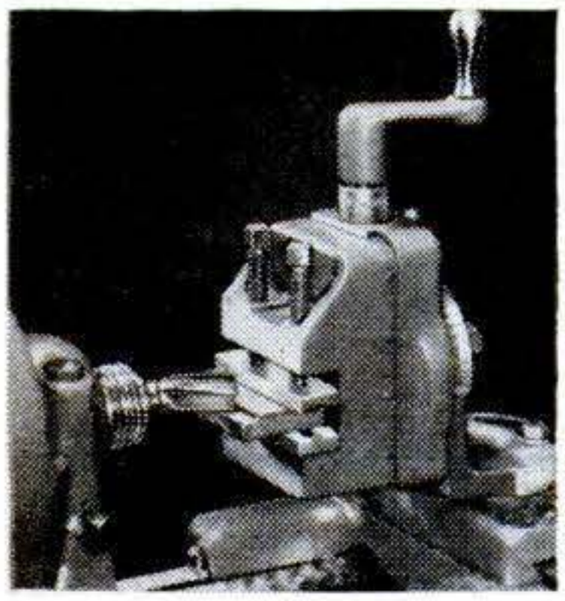
BORING



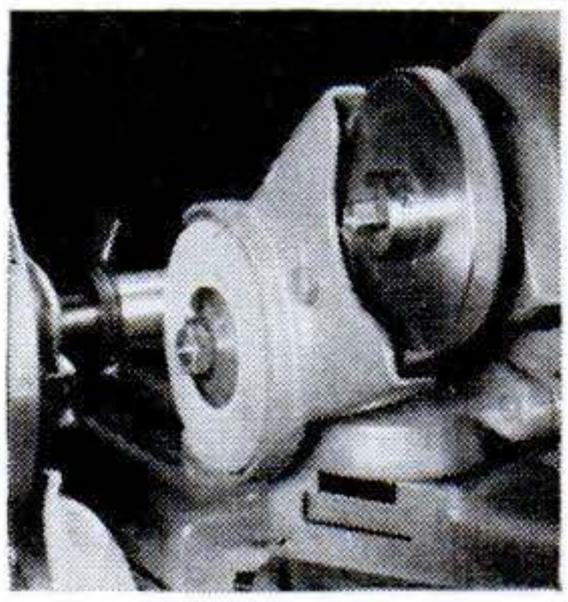
THREADING



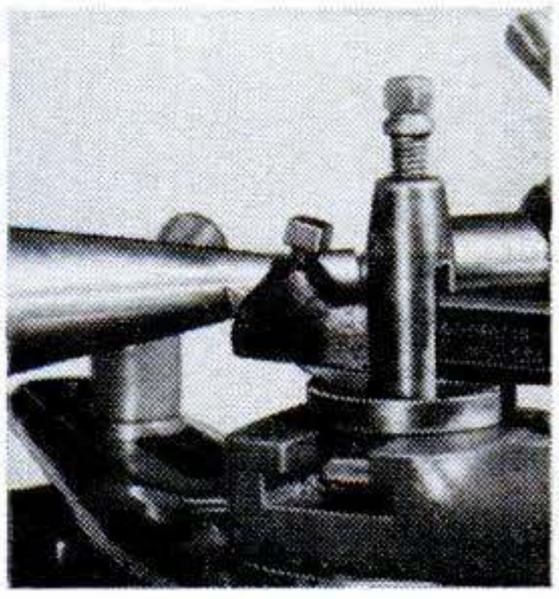
FACING



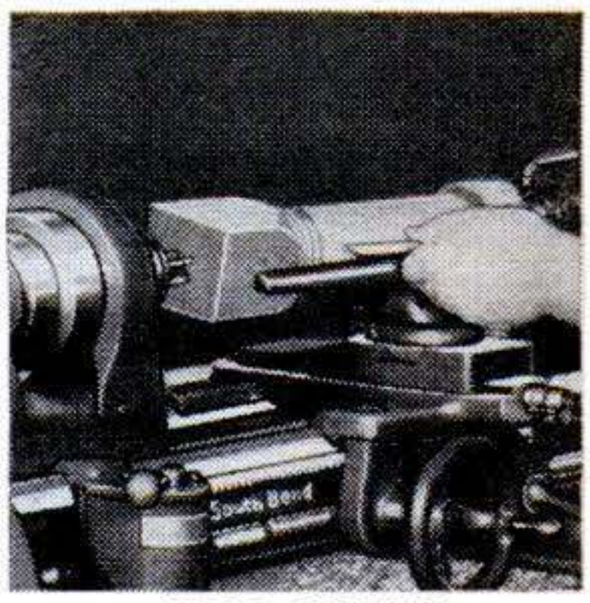
MILLING



GRINDING



TAPER TURNING



WOOD TURNING

Copyrighted material

DON'T PUFF and STRAIN!

Let your motor inflate your tires the EASY Way

PLAY SAFE. A spare tire that is uninflated can prove embarrassing when changing a roadside flat, or a slow leak tonight would mean a messy tire-changing job tomorrow. The Schrader Spark Plug Tire Pump is a quick, easy way to inflate your tires, air mattresses, rafts, etc.

SCHRADER SPARK PLUG TIRE PUMP

- Gauge tells when desired pressure is reached
- Spark Plug adapter*
- 16-foot hose reaches all tires

*specify spark plug thread size

ALSO available in complete kits with all five adapter sizes and special outfits for farm air service.

NO WORK! Pumps only clean, cool air. Fits in place of 1 Spark Plug. YOUR MOTOR DOES THE JOB!

LOW COST TIRE LIFE INSURANCE

#5050 Passenger Tire Gauge . . $1.60

Keep a Schrader Gauge in your glove compartment.

SEE YOUR REGULAR DEALER TODAY

If he can't supply you, send coupon direct to SCHRADER

SCHRADER, P. O. Box 240, Brooklyn 1, N. Y.

In trying to buy a Schrader Pump in my neighborhood, I find my dealers do not have one. Please let me know where I can get one.

My car is _____ *(make)* _____ *(model)* _____ *(year)*

Name _____

Address _____ *(street)*

_____ *(city)* _____ *(state)*

Please do not send money.

A. SCHRADER'S SON, ***Div. of Scovill Manufacturing Company Incorporated,*** **BROOKLYN, N. Y.**

World's Largest Manufacturer of Tire Valves, Gauges and Accessories

Copyrighted material

A Hit on Wheels

...and featured star **RAVEN MALONE** agrees—in roller skating...and in cigarettes too—"EXPERIENCE IS THE BEST TEACHER"!

SKATING comes naturally to Raven Malone! Her father is a well-known skating dancer. Above is a samba step from her own routines.

Equally at home on roller skates or ice skates, Raven started with several years of ballet training ...evidenced in this graceful entrance step she used in a revue.

It took a high-speed camera to catch this step! Raven says, "Experience is the best teacher—in cigarettes too. It's Camels for me!"

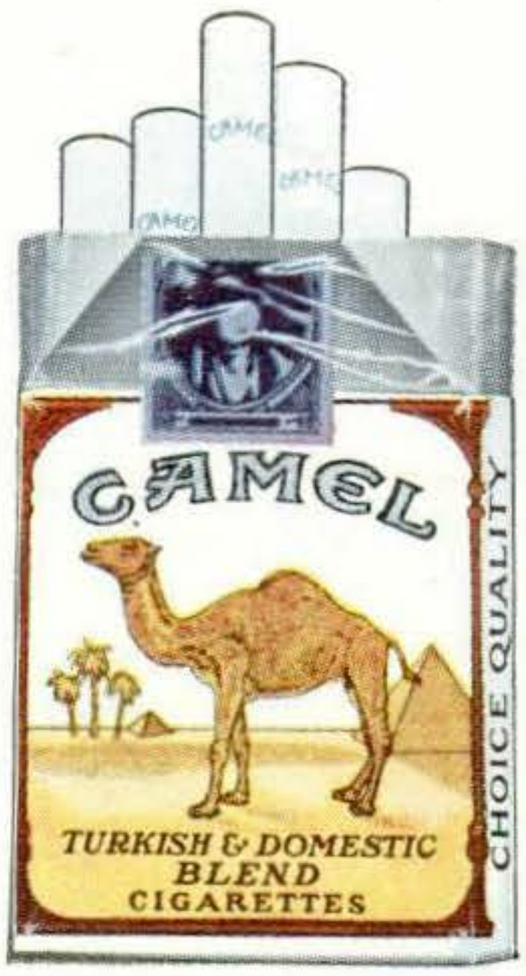
Let your "T-Zone" tell you why

More people are smoking Camels than ever before!

• All over the country...more and more smokers are finding that Camels suit them best! They smoked several brands—*compared* them . . . for flavor, mildness, and coolness. And smoker after smoker chose from experience the cigarette made from choice tobaccos, properly aged and expertly blended . . . Camel!

Try Camels *yourself*. See how that rich, full flavor delights your Taste...how that cool mildness appeals to your Throat. See if Camels don't suit your "T-Zone" to a "T"!

THE CHOICE OF EXPERIENCE!



According to a Nationwide survey:

MORE DOCTORS SMOKE CAMELS THAN ANY OTHER CIGARETTE

Three leading independent research organizations asked 113,597 doctors what cigarette they smoked. More doctors named Camel than any other brand!

R J Reynolds Tobacco Company
Winston-Salem, North Carolina

Copyrighted material